

APPLICATION FILED DEC. 12, 1919.

Patented May 10, 1921.
5 SHEETS—SHEET 1.

Fig. 1.

WITNESS:
Edwin L. McKee

Fig. 2. A detailed perspective view of a mechanical device, likely a pump or engine component. It features a long, curved arm (25) with a series of small, pointed or rounded segments (23) along its length. The arm is connected to a complex mechanism (20) at one end, which includes a curved plate (22) and a central pivot point (26). The device is supported by a frame (21) with various structural members (23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200). The device is shown in a perspective view, with the arm curving upwards and to the right.

Fig. 2.

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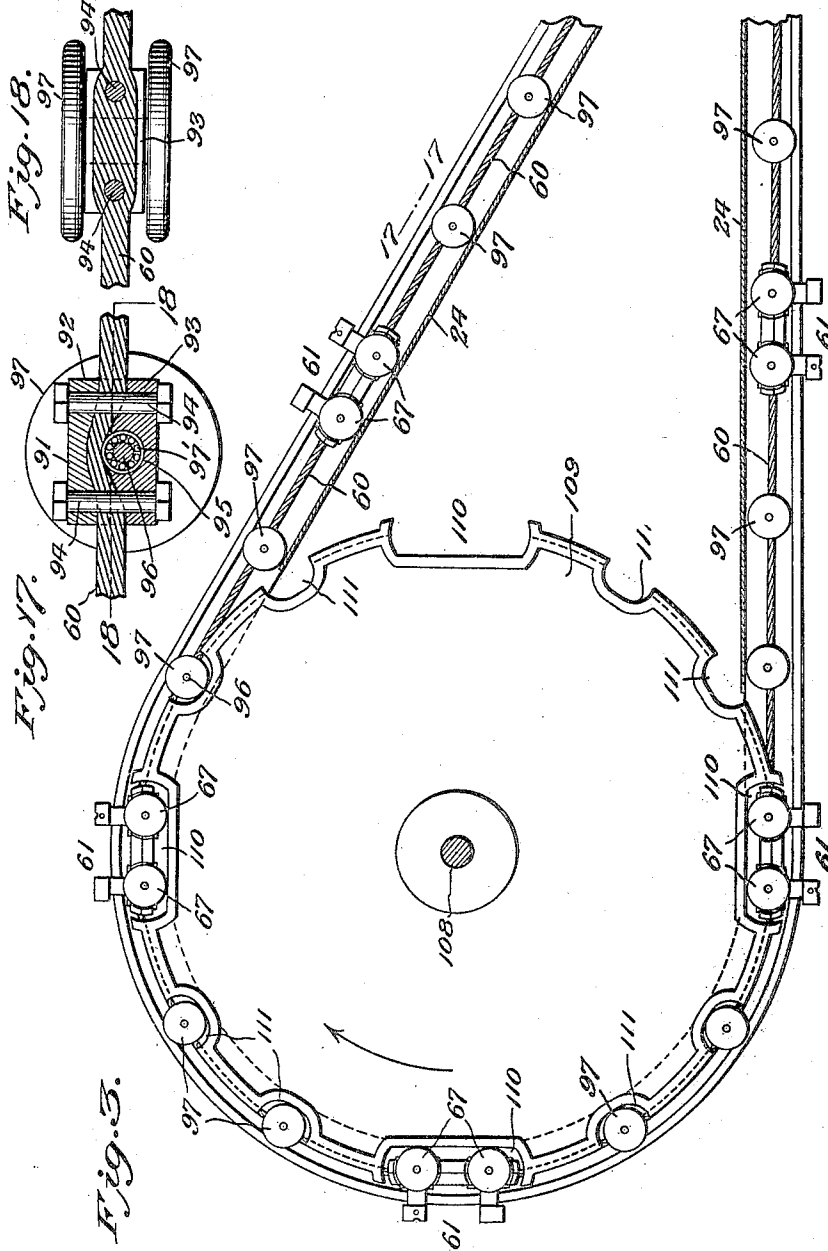
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1,377,800.

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5 SHEETS—SHEET 2.



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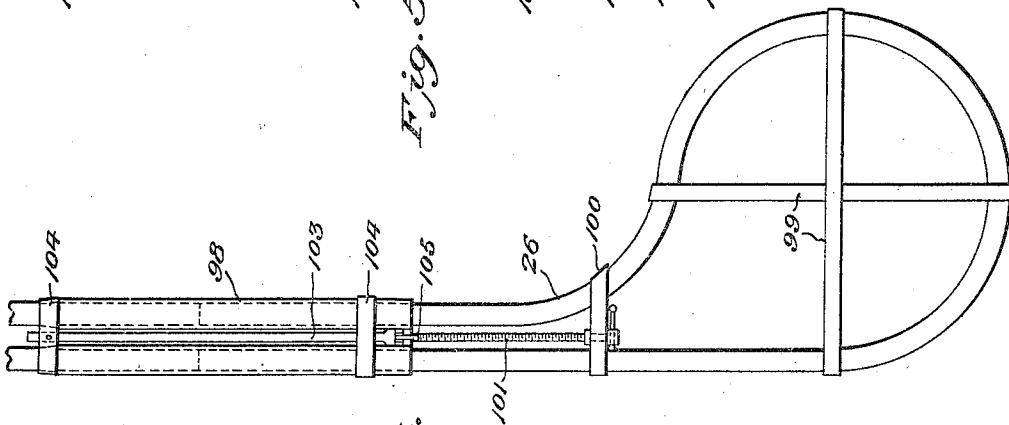
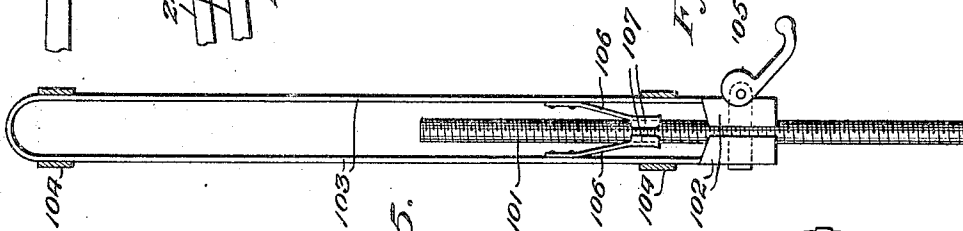
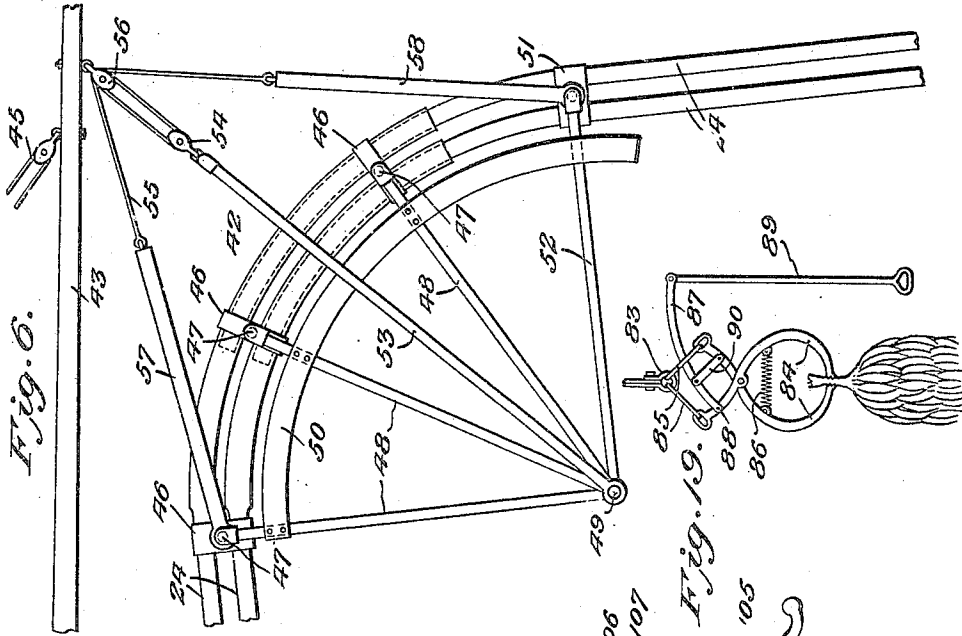
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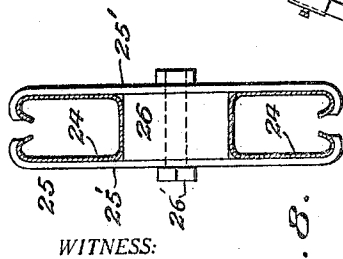
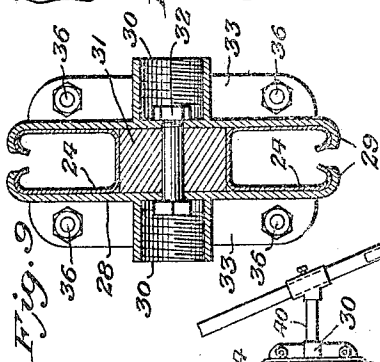
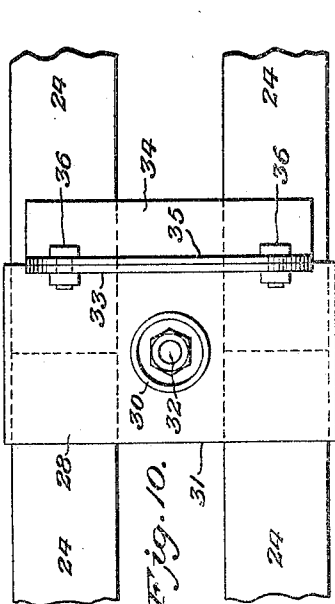
E. S. BROWN.
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5 SHEETS—SHEET 4.

1,377,800.



WITNESS:

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Fig. 8.

Fig. 11.

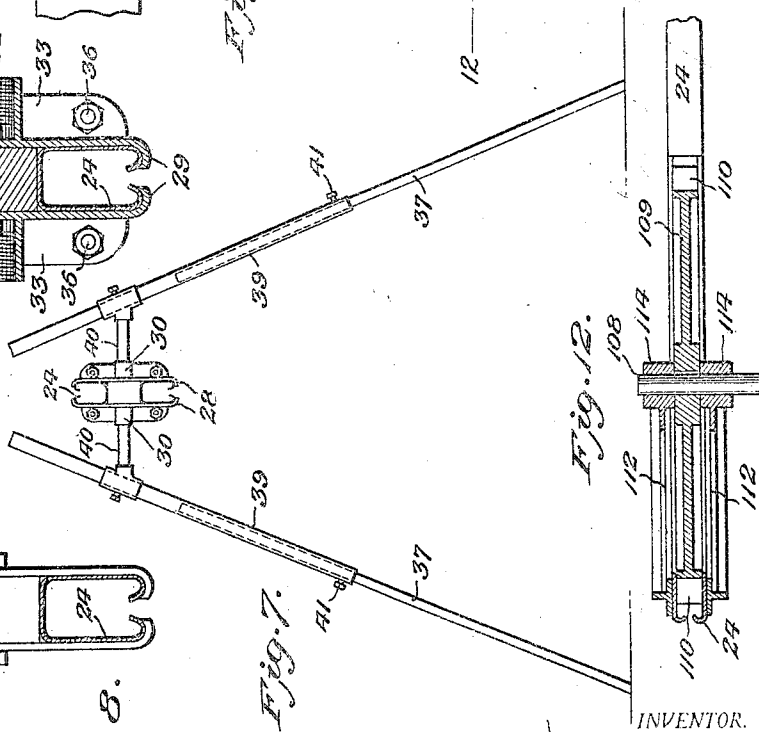
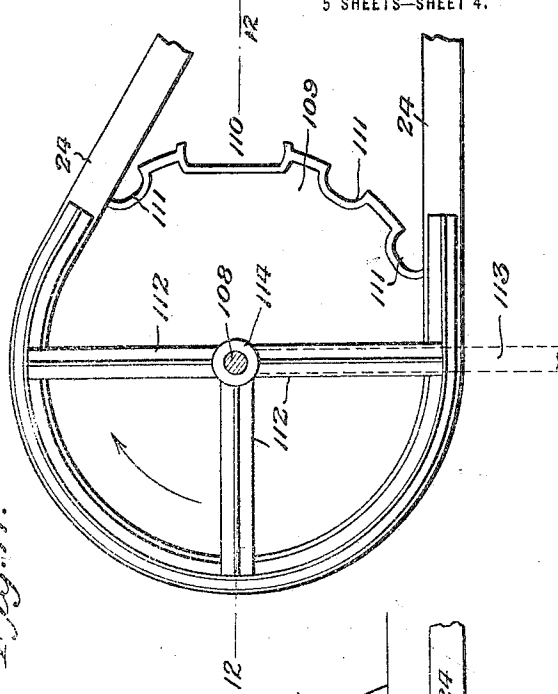


Fig. 12.

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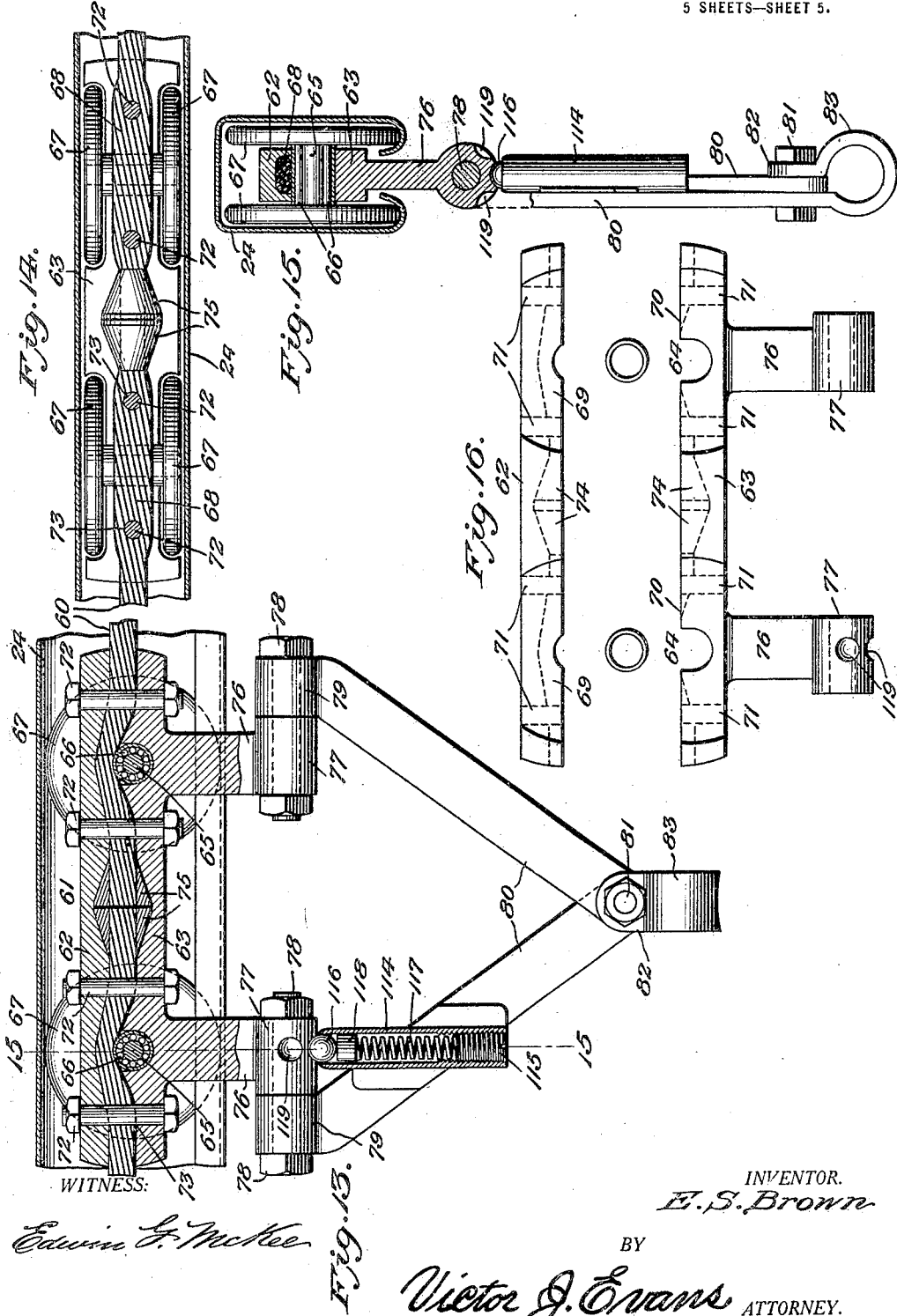
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Fig. 13.

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CONVEYER.

1,377,800.

Specification of Letters Patent.

Patented May 10, 1921.

Application filed December 12, 1919. Serial No. 344,377.

To all whom it may concern:

Be it known that I, EGBERT S. BROWN, a citizen of Australia, residing at East Savannah, in the county of Chatham and State of Georgia, have invented new and useful Improvements in Conveyers, of which the following is a specification.

This invention relates to conveyers or carriers for unloading or loading vessels and is especially adapted for handling bananas.

An object of the invention is the provision of a device of this character, which is readily portable and easily set up for use and which will occupy a minimum of space, permitting of its use in restricted places.

Another object is the provision of a conveyer or carrier, which is constructed of a number of independent units, which is especially adapted for use in vessels of different depths and for transporting the cargo a distance to suit the particular requirement.

Another object is the provision of a conveyer or carrier having a plurality of laterally extending supporting arms which are capable of being offset with respect to one another to provide for arranging the carried articles close to one another without contact and of being brought automatically into alinement during their travel, so that the articles may be released at a given point.

Another object is the provision of a track-supported conveyer or carrier in which the rollers or wheels traveling over the track are utilized to engage the driving wheel for the operation of the carrier.

Another object is the provision of a device including the above and other objects and advantages, which is simple in construction and operation and capable of use in handling cargoes of various kinds.

Other objects and advantages of the invention will appear as the following description is read in connection with the accompanying drawings:

In the drawings:

Figure 1 is a view in diagram illustrating the use of the invention.

Fig. 2 is a transverse sectional view.

Fig. 3 is an enlarged longitudinal sectional view through one end of the carrier illustrating its engagement with the driving wheel.

Fig. 4 is an enlarged elevation of the lower end of the carrier, and illustrating the means for adjusting the tension of the endless cable.

Fig. 5 is a vertical sectional view of the same.

Fig. 6 is an enlarged elevation showing the manner of supporting the intermediate portion of the carrier.

Fig. 7 is an enlarged transverse sectional view illustrating the means for adjustably supporting the top end of the carrier.

Fig. 8 is an enlarged transverse sectional view through the carrier track.

Fig. 9 is a similar view taken through the track connecting means and showing the threaded sockets for engagement with the track supporting legs.

Fig. 10 is an enlarged fragmentary elevation showing the manner of connecting the separate track units.

Fig. 11 is an enlarged fragmentary elevation of the dock end of the conveyer.

Fig. 12 is a sectional view on the line 12—12 of Fig. 11.

Fig. 13 is an enlarged detail sectional view illustrating the manner of connecting the carrier arms to the endless cable.

Fig. 14 is a sectional view of the subject matter illustrated in Fig. 13, the section being taken longitudinally of the cable.

Fig. 15 is a sectional view on the line 15—15 of Fig. 13.

Fig. 16 is a detail elevation showing parts of the carrier arm carried in separated relation.

Fig. 17 is an enlarged sectional view on the line 17—17 of Fig. 3.

Fig. 18 is a similar view on the line 18—18 of Fig. 17.

Fig. 19 is a detail view showing the manner of gripping and releasing a bunch of bananas or similar articles.

Referring to the drawings in detail, wherein like characters of reference denote corresponding parts, the reference character 20 indicates the hull of a vessel, which is shown as positioned at a dock or pier for the purpose of loading or unloading, the dock or pier being indicated at 21. The vessel 20 as shown includes a number of decks and that portion of the carrier which is shown as extending down into the hold of the vessel is supported by suitable connec-

tions 23, which connect the carrier with the decks of the vessel.

The carrier which constitutes the invention is herein shown as extending from the hold of the vessel upon the pier or dock, but it is of course obvious that it may extend upward for the purpose of transferring grain from the vessel to the grain warehouse or elevator, or for any other purpose. The carrier comprises an endless track which is formed of oppositely extending vertically disposed channel shaped members 24, these members being arranged in separate units comprising intermediate units 25 and terminal units 26 and 27, the unit 26 being arranged within the hold of the vessel while the unit 27 is arranged upon the dock end of the carrier. Each track unit 25 includes oppositely disposed track sections 24, which are connected by guide plates 25', having their ends welded or otherwise secured to the track sections 24. A spacing block 26 is interposed between the track sections and a bolt 26' passes through this block and through the plates 25'.

Each track unit is provided at one end upon opposite sides, with a plate 28, the ends of these plates being bent over the inwardly curved extremities of the track as indicated at 29. The plates 28 are welded or otherwise secured to the track sections and have projecting therefrom threaded thimbles 30, which provide sockets for the seating connections for the supporting legs for the dock end of the carrier, or for suitable elements for connection with the ends of the connecting members 23 of the vessel end of the carrier. Located between the plates 28 and the track sections is a spacing block 31 and passing through this block and through the plates 28 is a bolt 32. The plates 28 extend beyond the ends of the track sections as illustrated in Fig. 10 of the drawings and the outer edge of this plate is provided with a laterally extending ear 33. The adjacent unit has its track sections connected by oppositely arranged plates 34 which are spaced inward from the ends of the track sections and these plates are provided with laterally extending flanges 35, which are adapted to abut the flanges 33. These flanges are provided with openings for the passage of connecting bolts 36, which securely hold the plates 28 and 34 together with the extremities of the track sections of the adjacent unit extending within the outer edges of the plate 28 as shown by the dotted lines in Fig. 10.

The dock end of the carrier is supported upon legs 37 which are adjustable as to their length as shown in Fig. 7, the lower ends of these legs being suitably secured or anchored to the dock, while their upper ends enter a sleeve 39, which is carried at one end of an inwardly extending arm 40. This sleeve is

held in adjusted position upon the leg 37 by means of a set screw 41, while the inner end of the arm 40 is threaded for removable engagement with the threaded socket 30 which projects from the plate 28.

The ship end of the carrier and the dock end are connected by a curved telescopic joint 42, the purpose being to allow for a movement of the vessel, due either to the agitation of the water, or the rise or fall of the vessel as the latter is either lightened or loaded. This connection 42 is formed by curving the adjacent ends of the vessel and dock sections and by telescoping the former within the latter a sufficient distance to permit of the required movement. This portion of the carrier is supported from the dock, preferably, by a boom 43 which is carried by a mast 44 and provided with suitable tackle 45 for regulating the height of the outer end of the boom. In order to connect this portion of the carrier to the boom and to permit of a relative movement between the vessel end of the carrier and the dock end, this last mentioned end has its tracks connected by plates 46, which have detachably secured thereto outwardly extending arms 47, which are similar to the arms 40, except the outer ends of the arms 47 are connected to radially arranged parallel arms 48. The inner ends of these arms 48 are mounted upon a common pivot 49, while near their outer ends these arms are connected by arcuate plates 50, located upon each side of the conveyer or carrier. The adjacent ends of the vessel end of the track are connected by plates 51, to which are also secured laterally extending arms which terminate in parallel arms 52, the inner ends of which are mounted upon the pivot 49. The plates 50 are of sufficient length to extend beyond the arms 52 so that these arms are guided between these plates during the relative movement of the vessel end of the carrier. Also mounted upon the pivot 49 is a U-shape member 53 which embraces the track and extends inwardly thereof. Secured to the frame 53 is a sheave 54 and passing through this sheave is a cable 55, which also passes through a double sheave 56 which is mounted upon the end of the boom 43 connected to arms 57 and 58 which are mounted respectively upon the outermost arm 48 of the dock section of the carrier and the arm 52 of the vessel section.

It will be thus apparent that an upward movement of the vessel section of the carrier will cause a shortening of the end of the cable 55 between the sheave 56 and the arm 58 and a corresponding lengthening of the end of the cable 55 between the sheave 56 and the arm 57. This will permit the outer end of the dock section of the carrier to lower and compensate for the shortening of the vessel section of the carrier. The arms

52 will operate between the plates 50 and be guided therein and prevent lateral swinging movement of the carrier. As illustrated in Fig. 1, the legs 37 may be suitably trussed as shown at 59.

The cable which operates within the track is also formed of a number of independent units or sections so that its length may be regulated in accordance with the length of the track. These cable sections are indicated at 60 and have their ends secured together in a manner to be hereinafter explained. Connected to the cable at the point of connection of the cable sections 60 is a carrier 61, the latter comprising plates 62 and 63, which are hollowed out as shown in Figs. 13 and 16 of the drawings. The plates 63 are provided with spaced sockets 64, which are adapted to form a bearing for a transversely arranged shaft 65. This bearing is provided with anti-friction devices 66 and the shafts have mounted upon their outer ends wheels or rollers 67 which travel in the track 24. The cable sections 60 are flattened at points adjacent their ends as shown at 68 in Fig. 14 of the drawings and this flattened portion is gripped between a depression 69 formed in the plate 62 and a projection 70 of the plate 63, so that when the plates are secured together, they will bite into the cable and prevent relative longitudinal movement. The plates 62 and 63 are provided with openings 71 for the purpose of bolts 72 and these bolts also pass through openings 73 formed in the cable. The plates 62 and 63 are recessed as indicated at 74, the adjacent ends of the cable section 60 extending into this recess and being surrounded by a filling of fabric or other metal as indicated at 75.

Extending from the plate 63 are spaced laterally extending arms 76 and the outer ends of these arms are provided with sleeves 77, through which pass bolts 78. These bolts also pass through sleeves 79 provided at the ends of inwardly extending arms 80, the inner ends of which are connected by a bolt 81 to which is also connected an arm 82, the last mentioned arm having an eye 83 provided at its lower end and forming a carrier arm for connection to the article of cargo.

Various means may be employed for gripping the articles of cargo, one of such means being shown in Fig. 19 of the drawing. This consists of a pair of tongs 84 which have their inner ends connected to the eye 83 by means of links 85, the tongs being normally closed by means of a spring 86 so as to grip a bunch of bananas or other articles. To open the tongs and release the bunch of bananas, there is provided an arm 87 having one end pivotally connected to one member of the tongs as shown at 88 and its opposite end connected to an operating rod

89. Pivotaly connected to the other member of the tongs is a short arm 90, which is also connected to the arm 87 so that by pulling downward on the rod 89, the members of the tongs will be opened to release the load.

For the purpose of supporting the intermediate portions of the cable sections 60, there is connected to these sections at spaced intervals a carriage 91. This carriage consists of separate members 92 and 93, which are bolted together and to the cable 60 by means of bolts 94, the cable being flattened at this point as shown in Fig. 18 of the drawings. The section 93 is provided with a depression 95, to form a bearing for a shaft 96, to the outer ends of which are secured wheels 97 which travel in the track 24. This bearing is provided with anti-friction devices 97. By this means a cable will be prevented from coming in contact with the track at any point of its travel.

In order to secure the proper tension of the cable the terminal section 26 of the track telescopes within the adjacent unit as indicated at 98 in Fig. 4 of the drawings. This terminal section 26 is substantially circular to provide for turning the cable at this end of the carrier and is braced by arms 99. The terminal section 26 is further provided with a brace 100, within which is swiveled one end of a threaded rod 101. The opposite end of this rod passes through a split nut 102, which is located at one end of spaced spring arms 103. These arms are secured to the tracks of the adjacent conveyer unit 25 through the medium of connecting plates 104. The nut 102 is normally held open through the action of the spring arms 103, but may be closed to engage the threads of the rod 101 by means of a cam lever 105. To maintain the rod centered with respect to the nut when the latter is opened, there are provided inwardly extending spring arms 106 having one end secured to the arms 103 and their opposite ends provided with guides 107, which partially embrace and guide the rod 101 in its longitudinal movement. This adjustment permits of properly tensioning the endless cable for the purpose of maintaining a proper working relation of the parts.

Mounted upon an axle 108 located at the terminal section 27 of the carrier is a sprocket wheel 109, the axle being driven by any suitable power. This sprocket wheel is provided around its periphery with depressions 110 and 111, which are adapted to receive respectively the rollers or wheels 67 of the carriages for supporting the carrier arms and the rollers or wheels 97, these rollers or wheels engaging within the depression to operate the endless cable upon rotation of the sprocket. The track is cut away at this end of the carrier so as to

permit of the entrance therein of the sprocket. At this end of the conveyer, the track is braced by a frame which comprises a plurality of radially arranged key bars 112 which are mounted upon the axle 108 and are secured to the sides of the track. The upper ends of legs 113 provide bearings 114 for the reception of the axle and serve to support this end of the conveyer.

10 Secured to each of the conveyer arms is a sleeve 114 having one end closed by a threaded plug 115 and having projecting beyond its opposite end a ball 116. This ball is forced outward to its limit by means of a spring 117 which bears against the plug 115 and a follower 118, the latter in turn bearing against the ball 116. This ball is adapted to enter one of a plurality of radially arranged sockets 119 provided in one of the sleeves 77 which is carried by one of the arms 76.

In the operation of the invention, motion is imparted to the endless cable through the medium of the sprockets 109 and in handling articles of certain length, such as a bunch of bananas, the carrier arms 82 may be offset with respect to one another by the engagement of the ball 116 in one of the notches 119. The arm will remain in this position during its vertical movement and when the horizontal portion of the carrier is reached the arm will drop by gravity to a vertical position, where it will remain until the unloading point has been reached.

35 The proper length of the conveyer may be provided by adding or removing the desired number of sections of both track and cable and properly tensioning the same by means of a threaded rod 101.

40 The invention is susceptible of various changes in its form, proportions and minor details of construction, and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:—

1. A carrier comprising an endless cable, a track for said cable, said track comprising separate units and including oppositely disposed channeled members, means for connecting the channeled members of each unit together, to provide upper and lower guides open at their opposite ends, carrier arms secured to the cable and means engageable with the cable whereby the latter may be operated.

2. A carrier comprising an endless cable, a track for said cable, carrier arms secured to the cable, an adjustable terminal for one end of the track, means including a threaded shaft swiveled to the terminal and engageable with a normally opened split nut, said nut being provided with means for holding the same in engagement with the

threaded rod, a driving wheel rotatably mounted at one end of the cable and anti-friction devices carried by the cable for contact with the track and engagement with the wheel, whereby rotation of the latter will operate the cable.

3. A carrier comprising an endless cable, a track for said cable, carrier arms secured to the cable, an adjustable terminal for one end of the track, means including a threaded shaft swiveled to the terminal and engageable with a normally opened nut, said nut being provided with cam operated means for holding the same in engagement with a threaded rod, a driving wheel rotatably mounted at one end of the cable, and anti-friction devices carried by the cable for contact with the track and engageable with the wheel whereby rotation of the latter will operate the cable.

4. A carrier comprising an endless cable, a track for said cable, pivotally laterally adjustable carrier arms secured to the cable, means for yieldingly holding the carrier arms in adjusted position, a wheel rotatably mounted at one end of the cable and anti-friction devices carried by the cable for contact with the track and for engagement with the wheel, whereby rotation of the latter will operate the cable.

5. A carrier comprising an endless cable, a track for said cable, pivotally adjustable carrier arms secured to the cable, means including a spring actuated plunger for holding the carrier arms in adjusted position, a driving wheel rotatably mounted at one end of the cable and anti-friction devices carried by the cable for contact with the track and for engagement with the wheel whereby rotation of the latter will operate the cable.

6. A carrier comprising an endless cable, a track for said cable, carriages secured to the cable, a carrier arm adjustably and pivotally secured to each carriage, a spring actuated plunger secured to the carrier arm and engageable with sockets spaced around the pivotal section for holding the carrier arm in adjusted position, a driving wheel rotatably mounted at one end of the cable and anti-friction devices carried by the cable for contact with the track and engagement with the wheel whereby rotation of the latter will operate the cable.

7. A carrier comprising an endless cable, a track for said cable, carriages secured to the cable, spaced arms extending from the carriages, a carrier arm, means located at one end of the carrier arm for pivotal connection with each of the spaced arms of the carriage and means secured to the carrier arm and yieldingly engaging one of the spaced arms of the carriage for holding the carrier arm in adjusted position, a driving wheel rotatably mounted at one end of the cable and anti-friction devices carried by

the cable for contact with the track and engagement with the wheel whereby rotation of the latter will operate the cable.

8. A carrier comprising an endless cable,
5 a track for said cable, carriages secured to the cable, spaced arms extending from the carriages, a carrier arm, means located at one end of the carrier arm for pivotal connection with each of the spaced arms of the
10 carriage, and yieldable means for holding

the carrier arms in adjusted position whereby said arms may be brought into alignment by gravity, a driving wheel rotatably mounted at one end of the cable and anti-friction devices carried by the cable for contact with the track and engagement with the wheel, whereby rotation of the latter will operate the cable. 15

In testimony whereof I affix my signature.
EGBERT S. BROWN.