



(No Model.)

3 Sheets—Sheet 2.

B. J. HARRIS.

APPARATUS FOR LOADING OR UNLOADING ARTICLES INTO VESSELS.

No. 582,057.

Patented May 4, 1897.

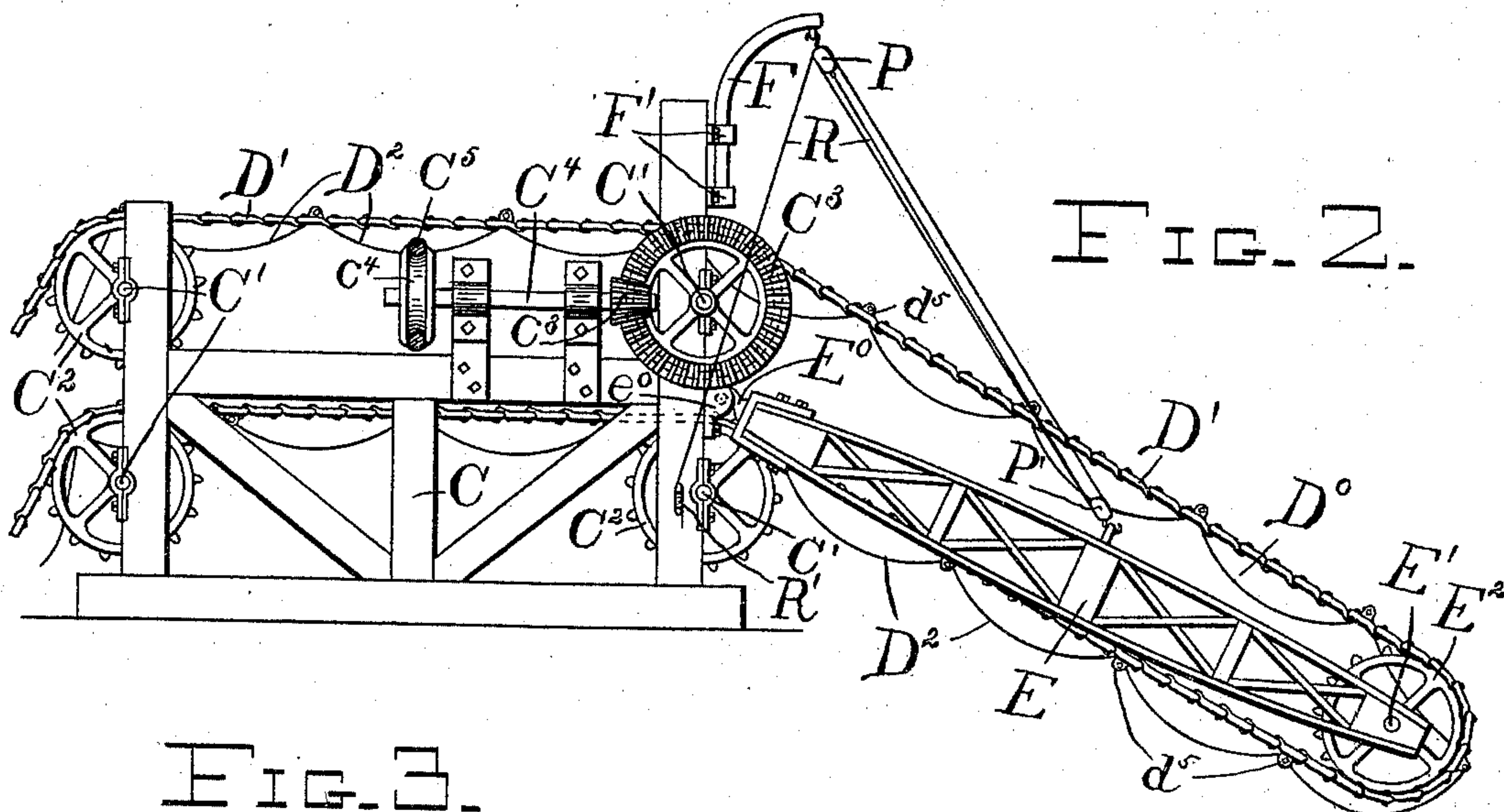


FIG. 2.

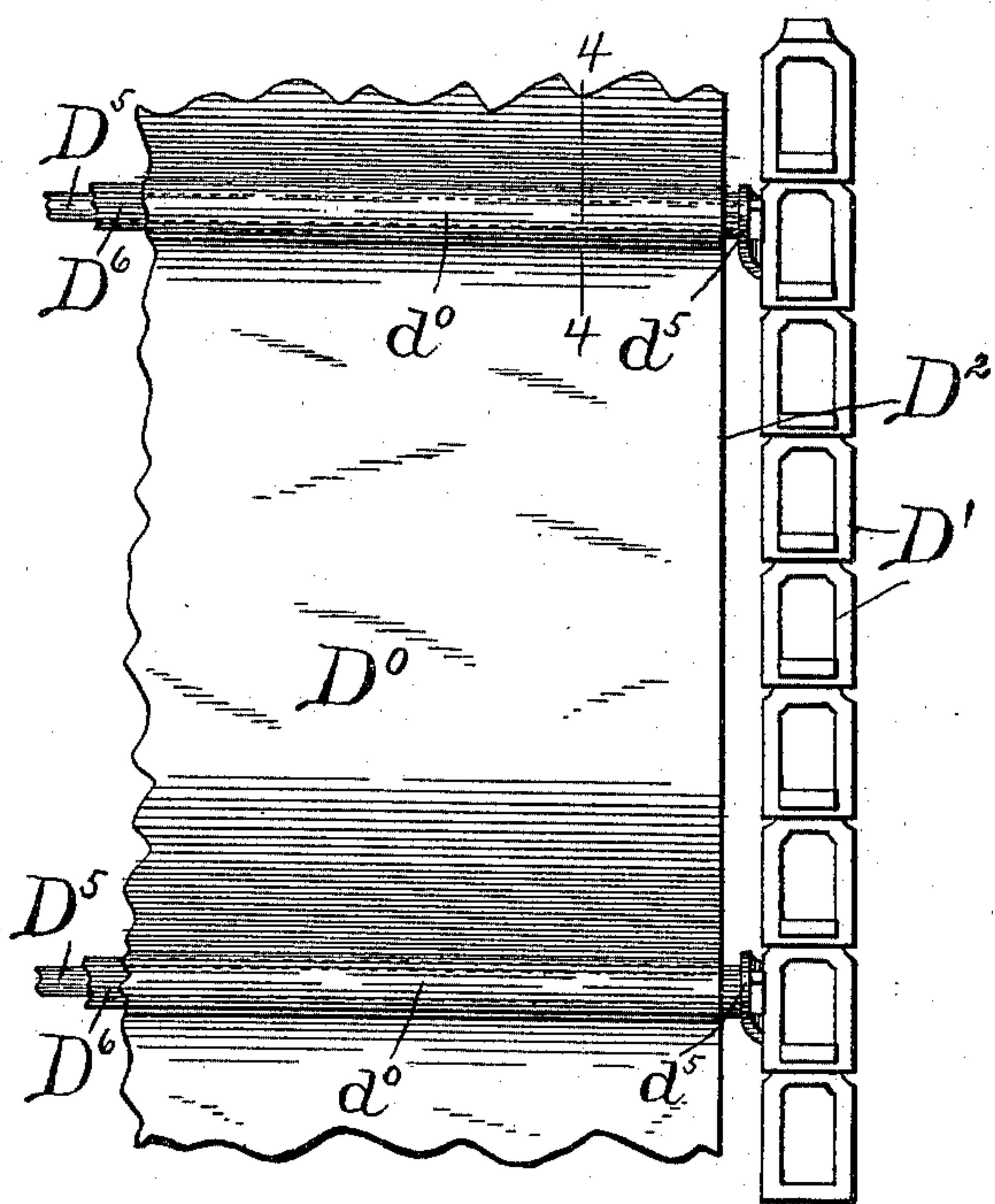


FIG. 3.

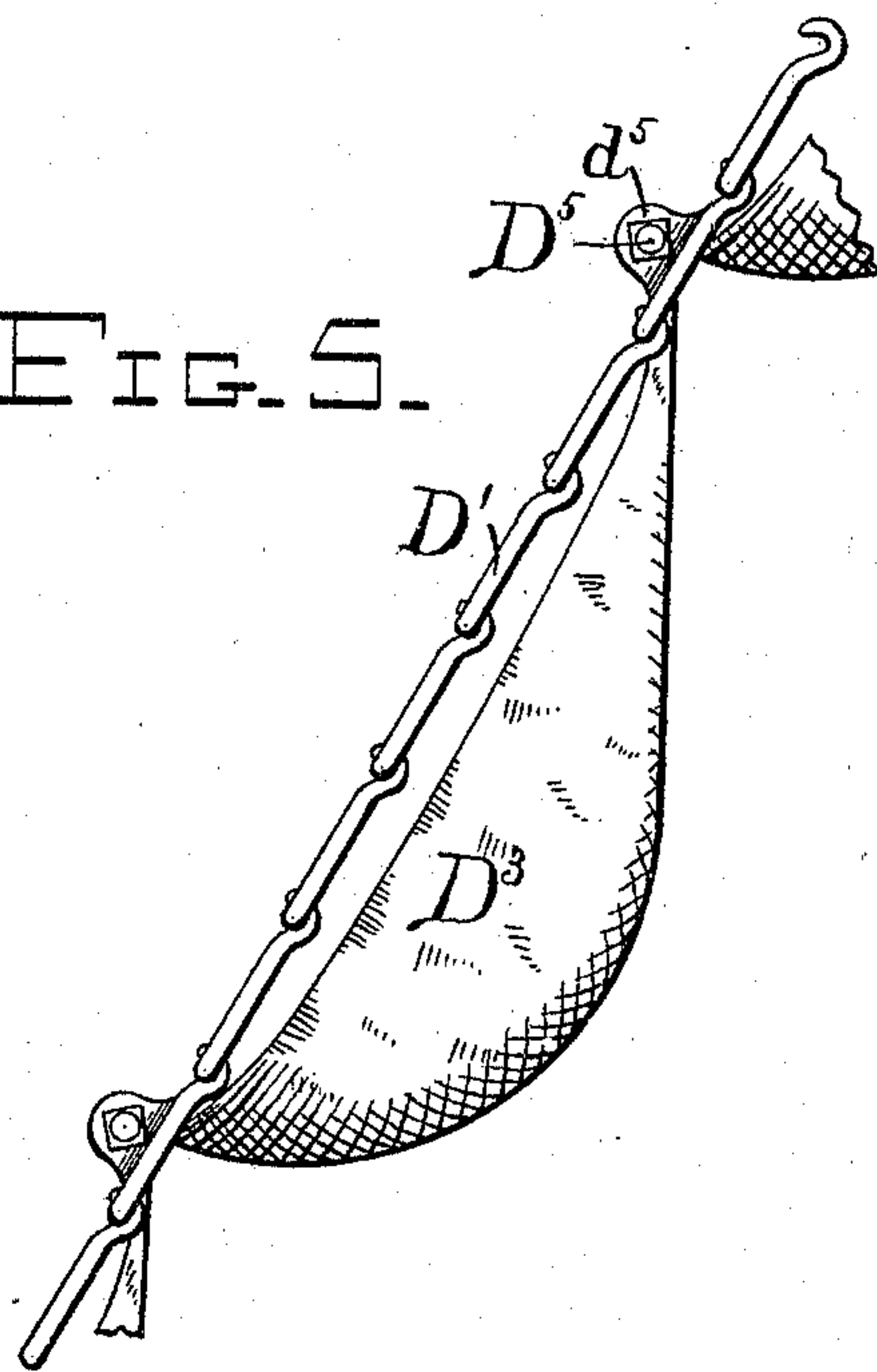


FIG. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE.

BEVERLY J. HARRIS, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF THREE-FOURTHS TO GEORGE JARVIS EDELSTON, JOHN B. PITT, AND WILLIAM HENRY BROWN, OF SAME PLACE.

APPARATUS FOR LOADING OR UNLOADING ARTICLES INTO VESSELS.

SPECIFICATION forming part of Letters Patent No. 582,057, dated May 4, 1897.

Application filed November 27, 1896. Serial No. 613,638. (No model.)

*To all whom it may concern:*

Be it known that I, BEVERLY J. HARRIS, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Apparatus for Loading or Unloading Articles into and from the Hold of a Vessel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for loading or unloading vessels and for similar purposes, and has for its object to provide more especially an apparatus whereby fruit, such as bunches of bananas, loose oranges, and other articles that require delicate handling to avoid injury, may be conveniently and rapidly loaded or unloaded into or from a vessel.

My invention consists in the apparatus hereinafter described and claimed.

Reference is had to the accompanying drawings, wherein the same parts are indicated by the same letters throughout the several views.

Figure 1 is a vertical cross-sectional view through the hull of a vessel and a barge lying alongside, showing my loading and unloading apparatus in elevation as used. Fig. 2 is an enlarged side elevation of the said apparatus, a portion thereof being broken away. Fig. 3 is a still further enlarged view of a portion of the endless carrier, showing the manner of attaching the canvas pockets thereto. Fig. 4 is a section taken on the line 4-4 of Fig. 3, and Fig. 5 is a view of a portion of the carrier shown in Fig. 3 as seen from the right in said figure. Fig. 6 represents a plan view of the apparatus shown in Fig. 2 with a portion of the carrier broken away to show the sprocket-wheels in pairs.

A represents the hull of the vessel being loaded, and A' and A<sup>2</sup> represent the spar-deck and main-deck, respectively, provided with hatchways A<sup>0</sup> and A<sup>00</sup>.

A<sup>3</sup> represents the hold of the vessel.

B represents the barge from which the bananas are being unloaded into the vessel.

C represents a frame movably mounted

upon the spar-deck A' to one side of the hatchway A<sup>0</sup>. This frame may be of any suitable construction sufficiently strong to stand the necessary strain thereon and sufficiently light to be readily moved about when necessary.

A plurality of shafts C' are journaled transversely in said frame C, and each of said shafts has mounted thereon a pair of sprocket-wheels C<sup>2</sup>. There should preferably be four of these shafts, but it will be obvious that any number, not less than two, may be used.

Rigidly mounted upon one of these shafts is a bevel-gear C<sup>3</sup>, and journaled in said frame at right angles to said shafts C' is a short shaft C<sup>4</sup>, which has rigidly mounted thereon a bevel-pinion c<sup>3</sup>, which meshes with the bevel-gear C<sup>3</sup> and drives the said bevel-gear C<sup>3</sup> and rotates the shaft upon which said gear is mounted. A pulley c<sup>4</sup> is also mounted upon the shaft C<sup>4</sup> and may be driven by a belt C<sup>5</sup> from any suitable source of power on the vessel. Instead of the pulley and belt a sprocket and chain may be used, if preferred.

D represents an endless carrier which is composed of a pair of endless chains D', adapted to run over the sprocket-wheels C<sup>2</sup> on the frame C and be driven through the bevel-gear C<sup>3</sup>, bevel-pinion c<sup>3</sup>, shaft C<sup>4</sup>, and pulley c<sup>4</sup> by means of the belt C<sup>5</sup>, as above described, and a canvas apron D<sup>2</sup>, stretched between the said chains. This canvas apron is provided with a number of loops or hems across the outer face thereof for the passage of rods D<sup>5</sup>, which pass through said loops or hems and are secured at their end to lugs or brackets d<sup>5</sup>, formed upon the chains D', as seen most clearly in Figs. 3 and 5.

To prevent injury to the fabric of which the apron is composed, as well as to prevent the bruising of the fruit to be handled, I preferably fit a jacket D<sup>6</sup>, of rubber hose or similar pliable material, over the rods D<sup>5</sup> to serve as a padding therefor, as seen in Figs. 3 and 4. This canvas apron is so hung between the chains D' that it will fall somewhat between each pair of cross-rods, thus forming a succession of pockets D<sup>0</sup>, as seen in Figs. 1 and 2. This apron may be formed of a flat strip of canvas, thus forming pockets with open ends, which will serve for carrying



articles in bulk, such as bunches of bananas, bags of grain, &c., or it may be supplied with end pieces  $D^3$  to adapt it for carrying a number of small articles, such as oranges, cocoa-  
5 nuts, coal, &c., as desired.

A pair of arms  $E$  are hung at their inner ends, as at  $E^0$ , by means of hooks or eyes, to brackets  $e^0$  on the frame  $C$ , so as to swing at their outer ends in a vertical plane, and have  
10 journaled in their outer ends a cross-shaft  $E'$ , upon which is mounted a pair of sprocket-wheels  $E^2$ , over which sprocket-wheels the chains  $D'$  of the endless carrier  $D$  run, as seen most clearly in Fig. 2.

A pair of davits  $F$  are mounted upon the frame  $C$  by means of brackets  $F'$ , and ropes  $R$ , reeving through pulley-blocks  $P$  on said davits and other pulley-blocks  $P'$  on said swinging arm, are used for raising and lower-  
20 ing the outer ends of said swinging arms to meet requirements and for supporting said swinging arms in the required position. Cleats  $R'$  are provided for the attachment of the ends of the ropes  $R$ . If desired, how-  
25 ever, a windlass or capstan may be provided upon the frame  $C$ , to which the ropes  $R$  may be led and wound up or paid out, as desired. The swinging arms  $E$  are of sufficient length to extend over into the barge or above the dock  
30 from which or to which the articles are being loaded or unloaded, and as the vessel rises and falls relative to the barge or deck the inclination of the height of the outer ends of the arms  $E$  may be varied, as above described.

A frame  $H$  is located in the hold of the vessel or in any place between decks convenient to the cargo, and a cross-shaft  $H'$  is journaled in this frame and has mounted thereon a pair of sprocket-wheels  $H^2$ , over which the chains  
40  $D'$  of the endless carrier run, as seen in Fig. 1.

A platform  $I$  may be provided to receive the articles from the carrier in loading the vessel or to facilitate their being placed upon the carrier in unloading.

45 Any suitable means may be provided for anchoring the frame  $H$  and the frame  $C$  in position when in use.

It is obvious that if it becomes necessary to shorten the length of the carrier or to in-  
50 crease the length thereof to adjust the same to the distance between the frames  $H$  and  $C$  in the former case the length may be shortened by removing the links of the carrier-chain between successive cross-rods and con-  
55 necting the terminal links together and the canvas pocket removed and the ends of the canvas sewed together again. When it is desired to lengthen the carrier, links are added and as many extra canvas pockets as  
60 necessary.

It will be seen that the flexibility of the canvas of which the apron is composed will allow the pockets thereon to sag in such a manner as to retain the article therein even  
65 when any portion of the carrier is running in a direction almost perpendicular, a sufficient length of canvas first having been left be-

tween each pair of cross-rods to form a pocket deep enough to contain the articles to be carried thereon.

70 While I have described and shown my apparatus as used upon a vessel, I do not wish to limit myself to such use, as it will be obvious that a similar apparatus might be used with advantage in storehouses, factories, and  
75 in many other connections with little or no modification.

When not in use, the swinging arms may be unshipped at their inner ends and may be drawn up and stored alongside of the frame  
80  $C$  out of the way.

The frame  $C$  may be stationary, but should preferably be movable, so as to be used upon either side of the vessel, as should also the frame  $H$ , which latter should be light enough  
85 to be moved about and used either in the hold or upon one of the decks.

It will thus be seen that I provide an apparatus whereby various articles, and especially fruit, may be conveniently and quickly  
90 loaded into or unloaded from a vessel without injury, such as is apt to ensue from the rough handling ordinarily given to a ship's cargo.

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

1. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears  
100 mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable  
105 source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, and means  
110 for raising and lowering and for supporting said arms; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted  
115 upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels, and a succession of pockets therein adapted to carry in either direction of the motion of the carrier and to adjust themselves to the inclination of the carrier during its  
120 movement, substantially as described.

2. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears  
125 mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable  
130 source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, and means for raising and lowering and for supporting



said arms; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels; a canvas apron suspended at intervals between said chains with sufficient slack between each longitudinal point of suspension and the adjacent point of suspension to form a sagging pocket, substantially as described.

3. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, and means for raising and lowering and for supporting said arms; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels; a canvas apron suspended at intervals between said chains with sufficient slack between each longitudinal point of suspension and the adjacent point of suspension to form a sagging pocket, and pieces of textile fabric secured across the ends of said sagging pockets, for closing said ends, substantially as described.

4. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, and means for raising and lowering and for supporting said arm; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels, cross-rods mounted at their ends at uniform intervals along said chains; and a canvas apron suspended from said cross-rods at intervals along its length somewhat greater than the intervals between said cross-rods, substantially as described.

5. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears

mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arm, a pair of sprocket-gears mounted upon said shaft, and means for raising and lowering and for supporting said arm; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels, cross-rods mounted at their ends at uniform intervals along said chains; and a canvas apron provided at intervals along its length somewhat greater than the intervals between said cross-rods with loops or hems inclosing said cross-rods and suspending said apron, substantially as described.

6. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, and means for raising and lowering and for supporting said arms; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels, cross-rods mounted at their ends at uniform intervals along said chains, soft casings inclosing said rods, and a canvas apron provided at intervals along its length somewhat greater than the intervals between said cross-rods with loops or hems inclosing said cross-rods and suspending said apron, substantially as described.

7. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, davits mounted upon said frame, block and tackle suspended from said davits and connected to said pivoted arms for raising and lowering and for supporting said arms; a frame independent of said first-mentioned frame located at a greater or less dis-



tance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels, and a succession of pockets therein adapted to carry in either direction of the motion of the carrier and to adjust themselves to the inclination of the carrier during its movement, substantially as described.

8. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, davits mounted upon said frame, block and tackle suspended from said davits and connected to said pivoted arms for raising and lowering and for supporting said arms, a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels; a canvas apron suspended at intervals between said chains with sufficient slack between each longitudinal point of suspension and the adjacent point of suspension to form a sagging pocket, substantially as described.

9. In a loading and unloading apparatus, the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, davits mounted upon said frame, block and tackle suspended from said davits and connected to said pivoted arms for raising and lowering and for supporting said arms; a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels; a canvas apron suspended at intervals between said chains with sufficient slack between each longitudinal point of suspension and the adjacent point of suspension to form a sagging pocket, and pieces of textile fabric secured across the ends of said sagging pockets, for closing said ends, substantially as described.

10. In a loading and unloading apparatus,

the combination with a frame, a plurality of shafts journaled therein, sprocket-gears mounted in pairs upon said shafts, and gearing connected to one of said shafts through which said shaft and the sprocket-gears thereon may be rotated from any suitable source of power; of a pair of arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, davits mounted upon said frame, block and tackle suspended from said davits and connected to said pivoted arms for raising and lowering and for supporting said arms, a frame independent of said first-mentioned frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted upon said cross-shaft; and an endless carrier having chains running over said sprocket-wheels, cross-rods mounted at their ends at uniform intervals along said chains, and a canvas apron suspended from said cross-rods at intervals along its length somewhat greater than the intervals between said cross-rods, substantially as described.

11. In a loading and unloading apparatus, the combination with a rigid frame C, a plurality of shafts C' journaled therein, sprocket-gears C<sup>2</sup> mounted in pairs upon said shafts, a beveled gear on one of said shafts, another shaft journaled on the said frame at right angles to the aforesaid shafts, a beveled pinion on said shaft meshing with said beveled gear, and a pulley mounted on said shaft for rotating the same; of a pair of trussed arms pivotally connected to said frame, and adapted to swing in a vertical plane, a shaft journaled in the outer end of said arms, a pair of sprocket-gears mounted upon said shaft, davits mounted upon said frame, block and tackle suspended from said davits and connected to said pivoted arms for raising and lowering and for supporting said arms; a frame independent of the aforesaid frame located at a greater or less distance therefrom, a cross-shaft journaled therein, and a pair of sprocket-gears mounted on said cross-shaft; endless chains passing over the said sprocket-wheels with lugs at intervals on the links thereof, cross-rods with their ends mounted in said lugs; rubber covers on said rods, and a canvas apron suspended from said cross-rods with sufficient slack between each longitudinal point of suspension to form a sagging pocket, and pieces of textile fabric secured across the ends of said sagging pockets, for closing said ends, substantially as described.

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

BEVERLY J. HARRIS. [L. S.]

Witnesses:

ANDREW HERO, Jr.

JNO. J. WARD.