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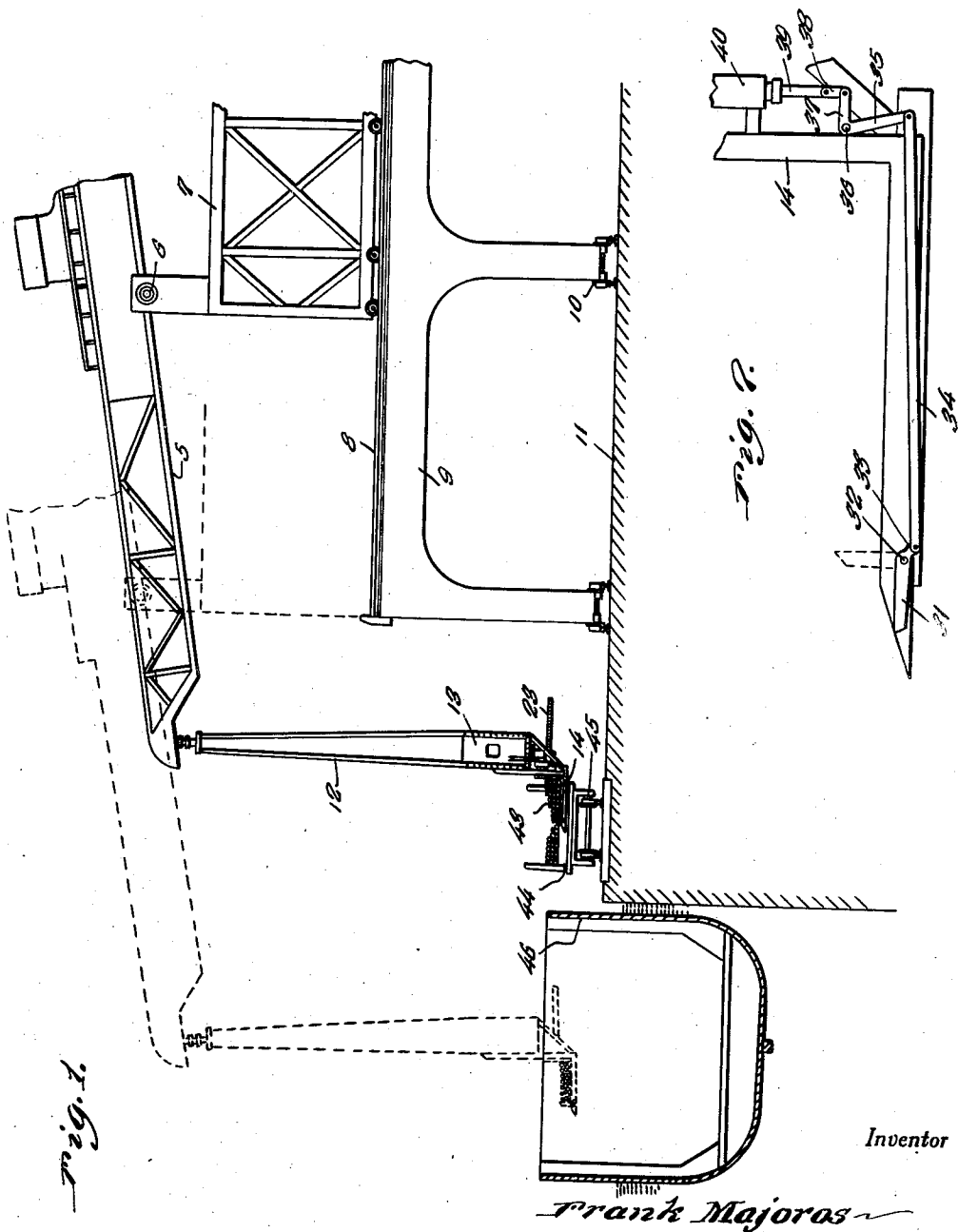
F. MAJOROS

2,219,630

ARTICLE HANDLING APPARATUS

Filed March 5, 1940

4 Sheets-Sheet 1



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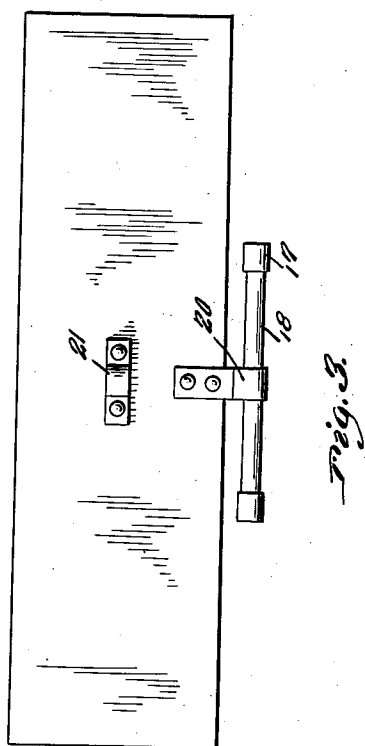
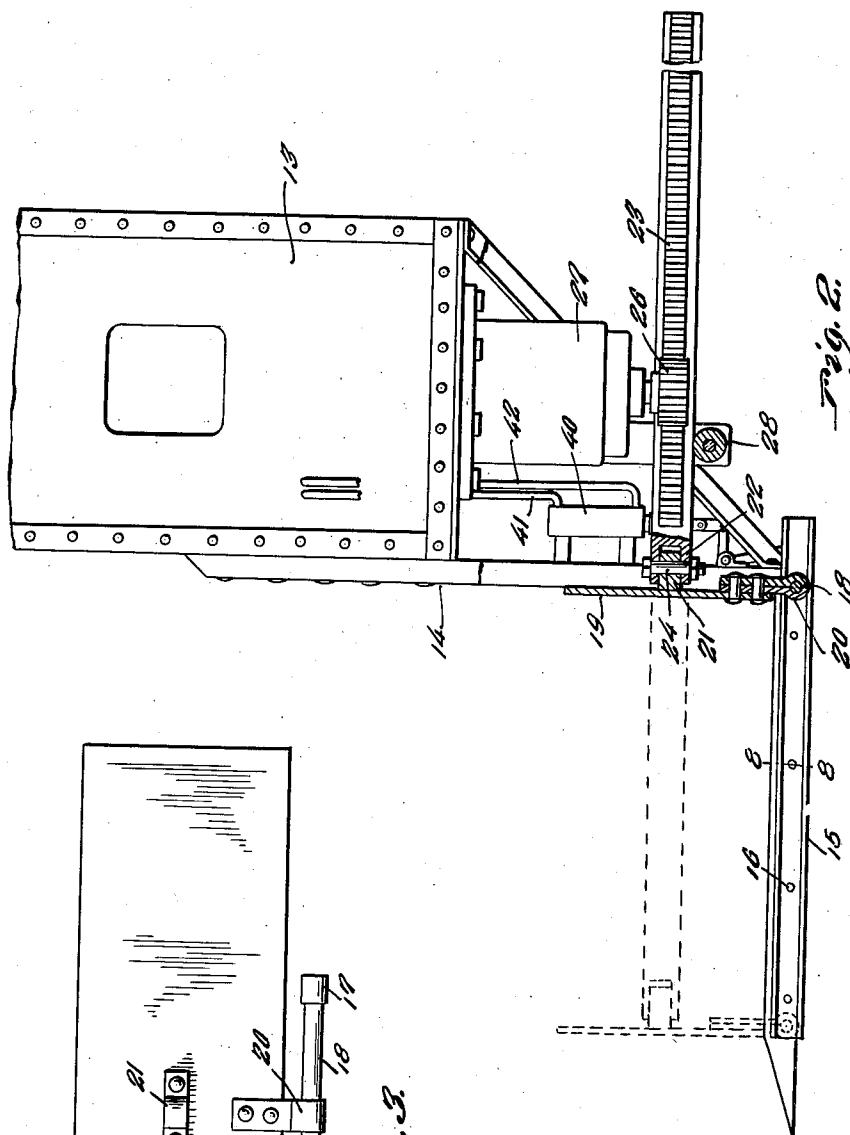
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4 Sheets-Sheet 2



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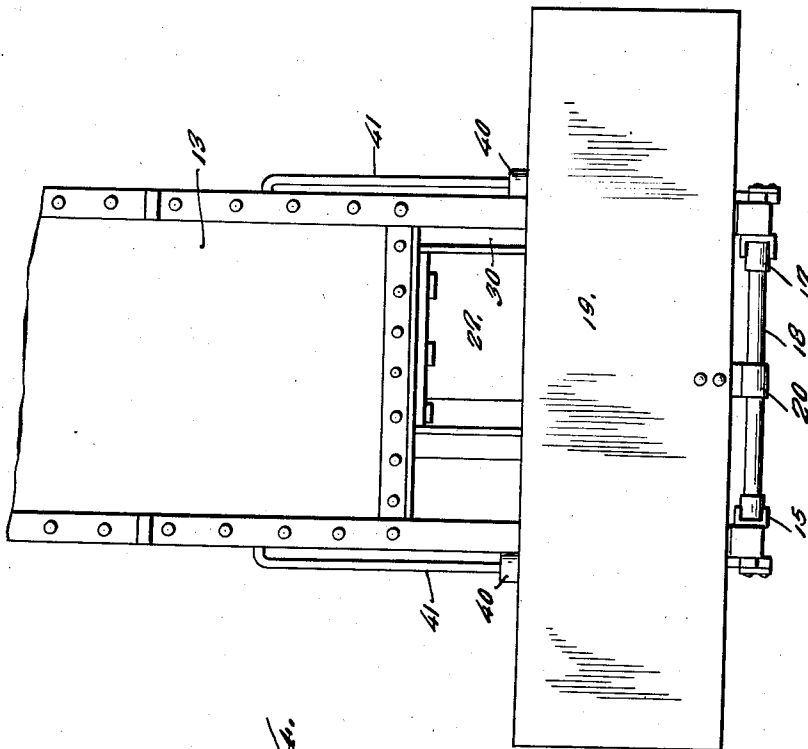
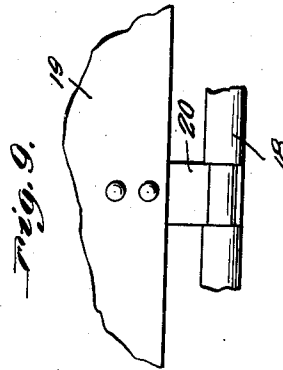
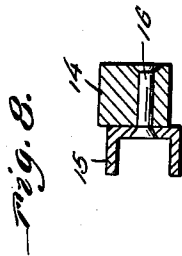
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4 Sheets-Sheet 3



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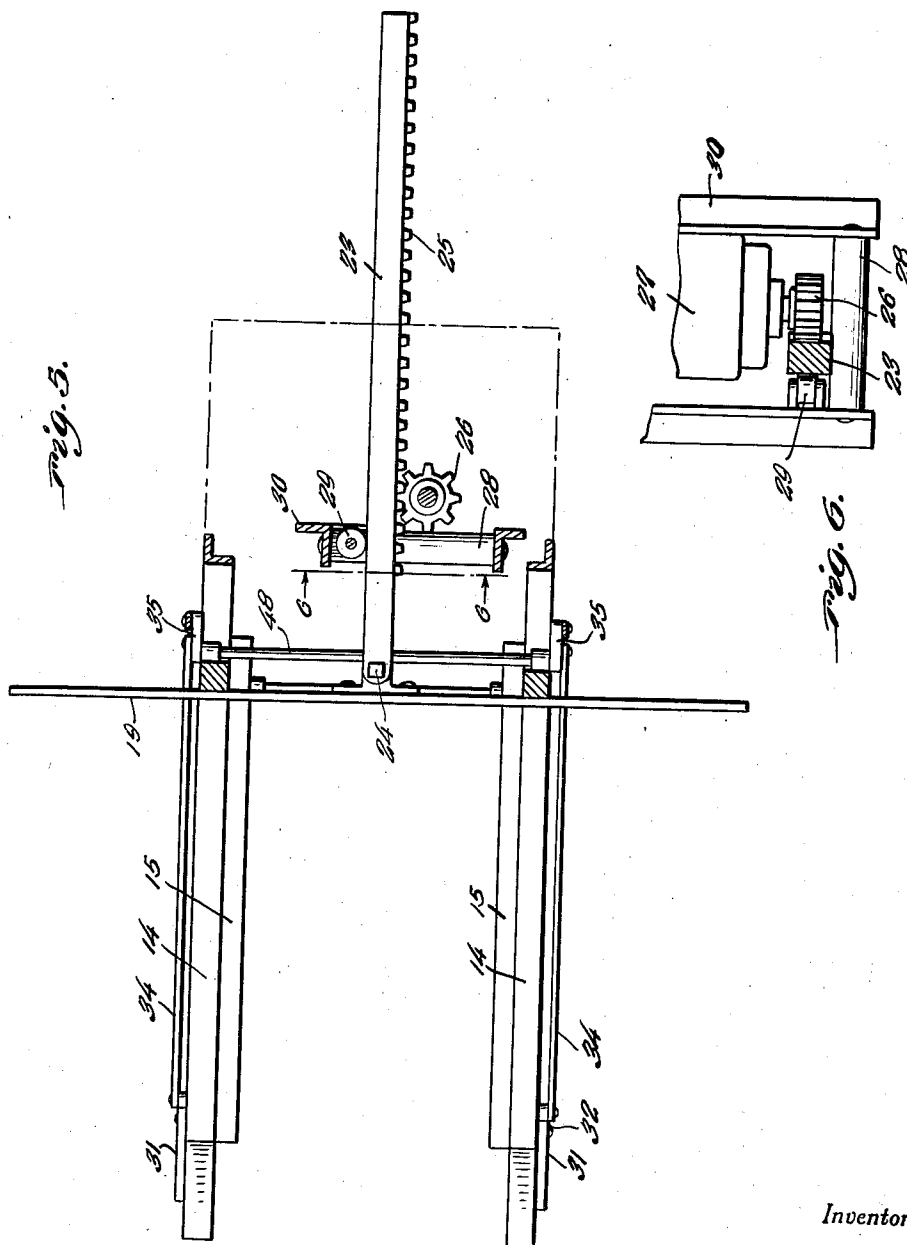
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ARTICLE HANDLING APPARATUS

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ARTICLE HANDLING APPARATUS

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Application March 5, 1940, Serial No. 322,367

6 Claims. (Cl. 212-14)

The present invention relates to machines for loading and unloading heavy articles from railway cars to ships, and for similar purposes, and has for its primary object to provide a power operated traveling lift having a load-supporting structure adapted for movement under a load of elongated objects, such as rails, pipe, bars and similar articles for engaging and lifting a group of the articles simultaneously and depositing the articles in the desired position for shipping purposes.

A further object is to provide a pair of spaced parallel horizontal lifting arms adapted for insertion under the articles to be handled and providing unloading means for the articles embodying a pusher plate adapted to push the articles off of the ends of said arms.

A still further object is to provide chock means at the outer ends of the arms to prevent accidental displacement of the articles therefrom and to provide means for manipulating the chocks into a position for releasing the articles from the arms.

A still further object is to provide an apparatus of this character, of simple and practical construction, which is efficient and reliable in performance, relatively inexpensive to manufacture and install in operative position on a conventional type of article handling apparatus, and which at the same time is otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part thereof, wherein like numerals refer to like parts throughout, and in which—

Figure 1 is a side elevational view showing the apparatus in use upon a wharf or dock.

Figure 2 is a fragmentary side elevational view of the lifting leg with parts shown in section.

Figure 3 is a rear elevational view of the pusher plate.

Figure 4 is a front elevational view of the lifting leg.

Figure 5 is a top plan view of the pair of spaced parallel forwardly projecting lifting arms with parts shown in section.

Figure 6 is a fragmentary sectional view taken substantially on a line 6—6 of Figure 5.

Figure 7 is a fragmentary side elevational view of one of the lifting arms showing the chock operating mechanism.

Figure 8 is a sectional view through one of the

arms taken substantially on a line 8—8 of Figure 2, and

Figure 9 is a detail of the attaching bracket between the pusher plate and the mounting therefor and with parts broken away and shown in section.

Referring now to the drawings in detail, the numeral 5 designates the pivoted beam of a conventional type of article handling apparatus, the beam being counterbalanced and pivoted as at 6 on the wheeled truck 7 mounted for traveling movement on the track 8 of the carriage 9 movably supported on the railway 10 of a loading dock 11. On the outer end of the beam 5 is suspended the leg 12 having the control cab 13 constructed at its lower end within which the operator for the machine is positioned. The foregoing describes the conventional type of article or material handling apparatus which usually includes a clam-shell bucket (not shown) attached at the lower end of the leg 12. This type of apparatus is adapted only for handling bulk material, and accordingly, in order to utilize the machine for use in handling rods, pipe, rails and other elongated articles, the clam-shell bucket is removed and in place thereof a pair of L-shaped arms 14 are secured to the lower end of the leg 12 with the lower ends of the arms projecting forwardly in spaced parallelism as more clearly shown in Figure 5 of the drawings.

To the inner side of each of the arms 14 is secured a channeled track 15 by means of rivets or the like. 16, having their heads countersunk, as more clearly shown in Figure 8 of the drawings, and slidably mounted in the tracks are the cylindrical heads 17 of a transversely extending guide bar 18 secured beneath an upright positioned pusher plate 19 by means of a bracket 20.

The pusher plate is positioned transversely of the arms 14 immediately above the latter and projecting rearwardly from the pusher plate is an apertured lug 21 attached to the bifurcated end 22 of a rack bar 23 by means of a pin 24. The rack bar is provided with the teeth 25 on one side thereof which are engaged by the pinion 26 operated by the motor 27 which is secured to the under side of the control cab 13. A guide roller 28 supports the under side of the rack bar and a guide roller 29 engages the rear side of the rack bar to maintain the same in engagement with the gear 26 during the reciprocating movement of the bar. The rollers 28 and 29 are journaled on hangers 30 which extend downwardly from the leg 12.

Adjacent the front of each of the arms 14 is

a pivoted chock 31 pivoted to the leg by means of a pin 32 and adapted to normally lie flatwise in parallelism against the outer side of the arm as shown in the full line position of Figure 7 of the drawings. The rear end of the chock 31 is provided with an angular extension 33 to which is pivoted a link 34 extending rearwardly and pivotally attached at its rear end to the lower arm of a bell-crank lever 35 which is pivoted at 36 to the rear portion of the arm 14. The other arm of the bell-crank extends horizontally as shown at 37 and has its free end pivotally connected to a link 38 attached to the lower end of a piston rod 39 extending upwardly into a cylinder 40. To the upper and lower portions of the cylinder are attached pipes 41 and 42 respectively, extending upwardly into the cab 13 for controlling the admission and discharge of fluid under pressure to the cylinder, whereby to control the pivotal actuation of the chock 31 from the full line position shown in Figure 7 to the dotted line position shown therein.

In the operation of the device it will be understood that the arms 14 may be moved under the stacks of articles shown at 43 which have been placed on the blocks 44 of a railway car 45, by previous handling, and after the chocks 31 have been raised into the dotted line position as shown in Figure 7 of the drawings, the articles may be lifted from the car for loading into the vessel shown at 46 anchored at the end of the dock 11. In order to remove the articles from the arms 14 the chocks 31 are lowered into the full line position shown in Figure 7 of the drawings, and the electric motor 27 is then operated to move the pusher plate 19 forwardly whereby to push the articles from the end of the arms 14, in a manner as will be apparent.

As shown in Figures 4 and 5 of the drawings, each of the chocks 31 may be controlled by an individual hydraulic cylinder 40 and the bell-cranks 35 may be pivoted on a common transversely extending bar 48.

It is believed the details of construction, operation and advantages of the device will be readily understood from the foregoing without further detailed explanation.

Having thus described the invention, what I claim is:

1. In an article handling apparatus of the class described, a vertically disposed lifting leg mounted for vertical and horizontal movement, a pair of spaced parallel horizontal arms projecting forwardly at the lower end of the leg and adapted for movement under a stack of articles to hoist the articles, tracks on the opposed sides of said arms, an unloading member bridging the arms and movable thereon for pushing the articles off the front ends of the arms and track engaging members mounted on the unloading member to guide the unloading member during movement thereof.

2. In an article handling apparatus of the class described, a vertically disposed lifting leg mounted for vertical and horizontal movement, a pair of spaced parallel horizontal arms pro-

jecting forwardly at the lower end of the leg and adapted for movement under a stack of articles to hoist the article, tracks on the opposed sides of the said arms, a reciprocating unloading member bridging the arms and movable thereon for pushing the articles off the front ends of the arms, a rod supported by the unloading member at its lower edge and track engaging members at the ends of the rod to guide the unloading member during movement thereof.

3. In an article handling apparatus of the class described, a vertically disposed lifting leg mounted for vertical and horizontal movement, a pair of spaced parallel horizontal arms projecting forwardly at the lower end of the leg and adapted for movement under a stack of articles to hoist the articles, tracks on the opposed sides of said arms, an unloading member positioned transversely of the arms, a rod attached to the lower portion of the unloading member having its ends movable along said tracks, a rack projecting rearwardly of the member, horizontal and vertical guide rollers for the rack and a motor driven pinion for reciprocally actuating the rack to remove the articles from the arms.

4. In an article handling apparatus of the class described, a vertically disposed lifting leg mounted for vertical and horizontal movement, a pair of spaced parallel horizontal arms projecting forwardly at the lower end of the leg and adapted for movement under a stack of articles of elongated form to hoist the articles, chock means at the front ends of the arms for retaining the articles thereon, means for moving the chock means into and out of load retaining position and including fluid operating means and an unloading member reciprocally mounted on the arms for pushing the articles off the front ends thereof.

5. In an article handling apparatus of the class described, a vertically disposed lifting leg mounted for vertical and horizontal movement, a pair of spaced parallel horizontal arms projecting forwardly at the lower end of the leg and adapted for movement under a stack of articles of elongated form to hoist the articles, a pivoted chock adjacent the front end of each arm, means for moving the chocks into and out of chocking position and an unloading member reciprocally mounted on the arms for pushing the articles off the front ends thereof.

6. In an article handling apparatus of the class described, a vertically disposed lifting leg mounted for vertical and horizontal movement, a pair of spaced parallel horizontal arms projecting forwardly at the lower end of the leg and adapted for movement under a stack of articles of elongated form to hoist the articles, a pivoted chock adjacent the front end of each arm, hydraulic actuating means for moving the chocks into and out of chocking position and slidable means for removing the articles from the arms.

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