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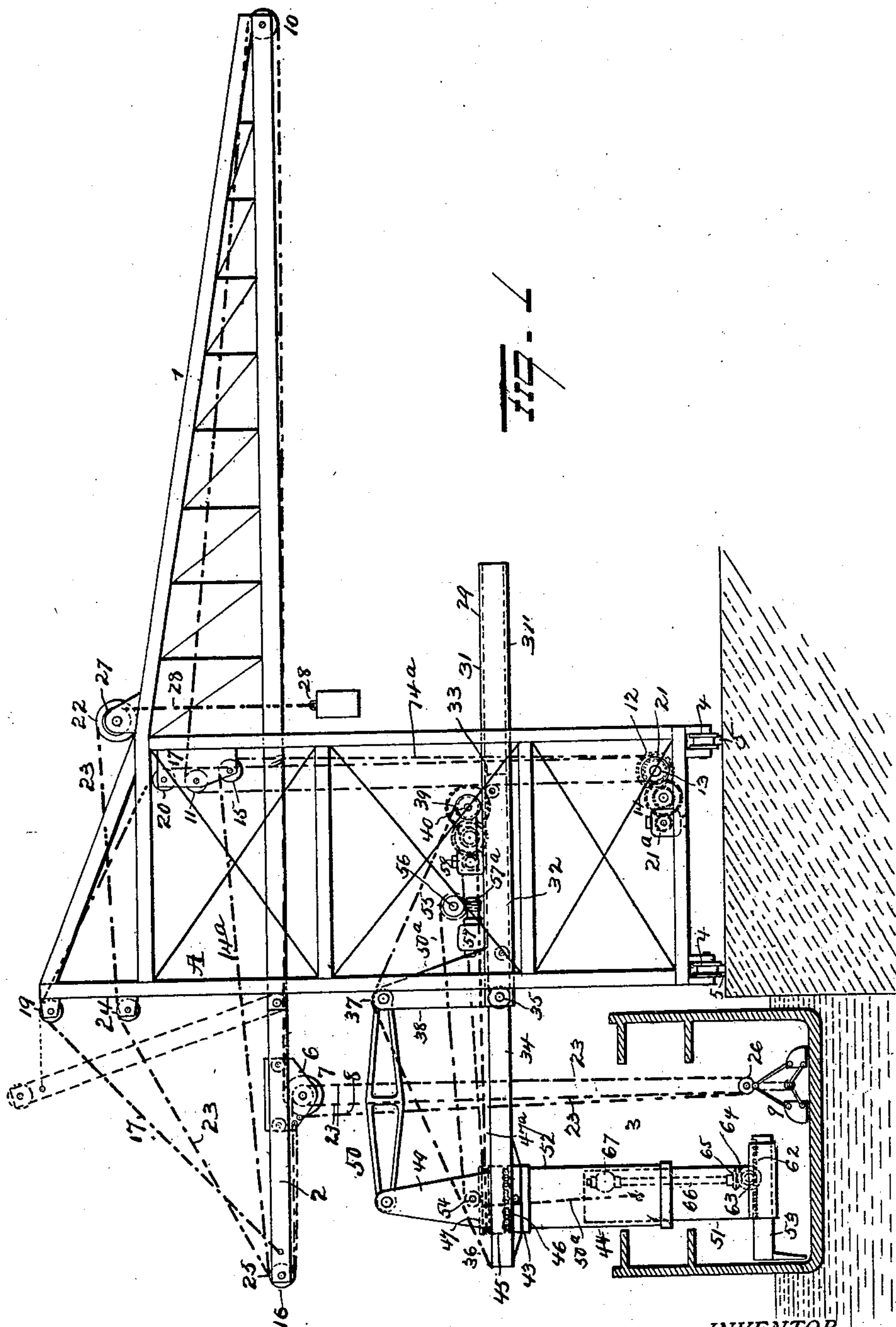
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UNLOADING APPARATUS.

(Application filed Apr. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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UNLOADING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 694,383, dated March 4, 1902.

Application filed April 20, 1901. Serial No. 56,761. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HULETT, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain
5 new and useful Improvements in Unloading Apparatus; 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
10 make and use the same.

My invention relates to improvements in unloading apparatus, and more particularly to means for facilitating the unloading of boats, one object of the invention being to
15 provide means for feeding material (such as ore or coal) in the hold of a boat to the buckets by which it is to be conveyed from the boat.

A further object is to provide means which
20 can be operated to scrape or move the ore or other material from any part of the bottom of the hold to a point or points within easy reach of the conveying-bucket.

A further object is to so construct the apparatus that the feeding or scraping means and the conveying means can be mounted upon the same framework and so that said
25 framework can be mounted independently of the boat.

A further object is to construct the apparatus in such manner that the bucket of the conveying apparatus and the feeding or scraping means can be operated simultaneously within a boat and so that one hatchway will
30 accommodate both sets of appliances at the same time.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of
40 parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of an apparatus embodying my improvements. Fig. 2 is an elevation of a
45 portion of the apparatus, showing the scraping and conveying appliances disposed differently from the positions shown in Fig. 1. Fig. 3 is a horizontal sectional view. Fig. 4 is a detail view.

50 A represents a tower or framework provided with a rearwardly-extending fixed

bridge 1 and a forwardly-projecting boom 2, pivotally connected to the frame or tower A and adapted to extend over a boat, (indicated at 3,) said framework being adapted to carry
55 all the mechanism and being mounted on wheels 4 to run on track 5 near the edge of a dock to accommodate the apparatus to the hatchways of the boat. The frame or tower A, bridge 1, and boom 2 are provided with
60 alined tracks for the accommodation of a carriage 6, provided with a suitable pulley 7 for the passage of a cable 8, connected with a grappling-bucket 9 for raising it. The cable 8 extends rearwardly from the carriage and
65 passes over a pulley 10 at the far end of the bridge 1, then forwardly and over a pulley 11 in the tower, and then downwardly and wound on a drum 12, carried by a shaft 13, mounted in the lower portion of the tower.
70 Another drum 14 is located on the shaft 13, and from this drum a cable 14^a passes upwardly over a pulley 15, then forwardly over a pulley 16 at the forward end of the boom 2, and then rearwardly and secured to the carriage 6 for moving the latter on the tracks.
75 Another cable 17 is provided for raising the boom 2. This cable is attached to the forward end of the boom and passes thence over a pulley 19 at the top of the tower A,
80 from whence it passes downwardly over a pulley 20 and thence down to and wound on a drum 21 on the shaft 13. The shaft 13 may be driven through suitable gearing from an electric or other motor 21, and the operation
85 of the various drums on the shaft 13 may be controlled by means of clutches and brakes of any suitable construction. A drum 22 is mounted on the tower and has wound thereon a cable 23, which passes forwardly from said
90 drum over a pulley 24 on the tower, thence over a pulley 25 at the forward end of the boom, thence rearwardly over a pulley on the carriage, thence under a pulley 26, carried by the bucket-frame, and then extended up
95 to and secured to the carriage. In order to maintain the cable taut, a small drum 27 is mounted to rotate with the drum 22, and on this small drum a weighted cable 28 is wound. A suitable brake will preferably be provided
100 for controlling the rotation of the drums 22 and 27.

The mechanisms thus far described for controlling the operations of the bucket and the travel of the carriage are shown and described more in detail and their manner of operation 5 fully explained in Letters Patent granted to me on the 20th day of March, 1894, and designated by No. 516,864, to which reference is made, a fuller description of these mechanisms in this case being therefore deemed su-
10 perfluous.

About midway between the base of the tower and the bridge 1 two horizontally-disposed channel-bars 29 30 are located, the flanges 31 31' of one of said bars projecting
15 toward the similar flanges of the other bars for a purpose presently explained. The bars 29 30 are thus so disposed that the apparatus which they are intended to support can be readily projected over a boat, and said bars
20 in order to be of suitable length to perform the functions for which they are intended are made to project rearwardly beyond the tower A. The channel-bars 29 30 serve to support and guide a carriage 32, made in two sections
25 33 34, hinged together at 35, the outer hinged section 34 being maintained in position over a boat by means of a cable 36, attached to the forward end of section 34 of the carriage, said cable passing from its connection with
30 the beam upwardly over a pulley 37 at the upper end of a post 38 on the section 33 of the carriage and then downwardly and wound on a drum 39 on a shaft 40, mounted on the sliding carriage 32, said drum being provided
35 with suitable clutch and brake devices for controlling its operation to raise the hinged section 34 of the carriage and maintain it in a horizontal position or to lower said section 34, so that it will be disposed alongside the
40 tower when the apparatus is not in use, and also for raising the hinged member of the carriage to remove the appliances carried thereby from the boat. The section 33 of the carriage, which is adapted to slide longitudinally be-
45 tween and be guided by the channel-bars 29 30, is provided with two pairs of rollers 41 41^a to reduce friction, and as the weight of the appliances to be carried by the carriage will fall upon the outwardly-projecting hinged
50 section (as will presently be made clear) 34 one pair of rollers 41 will run on the upper flanges 31 of the channel-bars and the other pair of rollers 41^a will run upon the other pair of flanges 31' of said bars.

55 The section 34 of the carriage is made with an opening 42, and beyond said opening a tubular head 43 is pivotally supported in the carriage 32, near the extreme outer end thereof. A tubular leg 44, intended to depend into
60 a boat, passes through the pivoted head 43 and is provided near its upper end with an annular flange 45, which constitutes the upper bearing for a series of antifriction balls or rollers 46, the lower bearing for said balls
65 being upon the said pivoted head 43. Above the roller-bearing thus formed the depending leg 44 is provided with a drum or pulley 47,

around which a cable 47^a passes for rotating the depending leg, motion being imparted to said cable from a drum 48, located on the 70 shaft 40, and a suitable clutch is provided for controlling the operation of said drum. It is desirable that the depending leg shall always maintain a vertical position, and for this purpose a post 49 projects upwardly from the piv- 75 oted head 43, and this post is connected with the post 38 by a cross-bar 50, pivotally attached at its respective ends to said posts.

The depending leg 44, hereinbefore referred to, comprises two members, the lower mem- 80 ber 51 telescoping within the upper member 52, and the lower member is provided with a scraper 53 for the purpose of pulling the material in the boat to a position where it will be within easy reach of the bucket. For the 85 purpose of raising and lowering the lower telescopic member of the depending arm, so as to accommodate the scraper to the height of the material in the boat and to accommodate the apparatus to boats of different depths, a cable 90 50^a is attached at one end to member 51 of the leg and passes upwardly through the upper member 52 of said leg and over a pulley 54, from which the cable passes to and is wound upon a drum 55, mounted on a shaft 95 56 on the carriage; to which shaft motion is imparted by means of an electric or other motor 57 through the medium of worm-gear 57^a. As before mentioned, the carriage 32 is adapted to slide longitudinally, the purpose of which 100 is to dispose the depending leg 44 and the scraper carried thereby in any desired position in the boat—such, for instance, as shown in Fig. 1 or as shown in Fig. 2. For accom- 105 plishing the sliding movement of the carriage 32 a pinion 60 is mounted on the shaft 40, adapted to be locked thereto by means of a suitable clutch, and this pinion meshes with a rack-bar 61 on the carriage, or, if desired, the shaft 40 may be provided with two pin- 110 ions 60 to mesh with rack-bars on the respective girders composing the carriage. The shaft 40 is driven through suitable gearing 58 by an electric or other motor 59. The motors 57 and 59 and the various clutches and 115 brakes for the drums on the shaft 40 are controlled, preferably through the medium of electrically-operated devices, by an operator stationed in the hollow depending leg 44.

The scraper 53 is mounted to move longi- 120 tudinally in the lower end of the member or section 51 of the depending leg 44 and is provided on its upper edge with a rack 62, with which a pinion 63 meshes for the purpose of sliding said scraper. The shaft of the pinion 125 63 is mounted in the member 51 of the leg 44 and is provided with a bevel-pinion 64, which receives motion from a bevel-pinion 65, secured to the lower end of a vertical shaft 66. An electric motor 67 is located in the upper 130 portion of the lower member of the depending leg and is connected with the vertical shaft 66. This motor is also controlled by the operator stationed in the depending leg.

In starting the apparatus the motor 59 will be put into operation and the drum 39 locked to the shaft 40 to raise the hinged section of the carriage 32. When the carriage 32 has been raised high enough to clear the boat, the pinion 60 will be locked to the shaft 40 to move the carriage 32 outwardly over the boat, after which the drum 39 will be manipulated to lower the hinged section of the carriage 32 and permit the leg 44 to depend through the hatch of the boat. The motor 57 will now be started, so as to lower the section or member 51 of the telescopic leg until its lower end is below the deck of the boat. The leg may then be rotated (by throwing the drum 48 into locked engagement with the shaft 40) until the scraper projects under the deck. The telescopic section 51 will then be further lowered until the scraper encounters the ore or coal. The motor 67 in the leg will then be started, and motion will be imparted by it through the rack and pinion gearing to the scraper.

From the construction and arrangement of parts above described it will be seen that the conveying and scraping or feeding apparatus are carried upon a single movable structure located on the dock and that all of the apparatus is supported entirely independent of the boat. By means of the apparatus the scraper can be operated to feed the ore or coal from any part of the boat to the bucket or within convenient reach of the bucket and that all of the ore or coal in the bottom of the boat can be moved by the scraper to a point where it can be scooped by the bucket. When the parts are in the positions shown in Fig. 1, the scraper will be operating to collect the ore or coal to within easy reach of the bucket when the latter is in the position shown in Fig. 2, so that while the ore or coal is being removed by the bucket from the boat at one side of the center line thereof the scraper will be operating to collect the material at the other side of the center line in position to be reached by the bucket when the scraping and conveying devices are shifted. The entire apparatus can be moved along the dock to accommodate the conveying and scraping appliances to various hatches of the boat. The conveying appliances can be controlled by an operator stationed on the tower, and the scraping devices can at the same time be controlled by the operator stationed in the depending leg 44.

Various changes might be made in the details of construction of the apparatus without departing from the spirit of my invention or limiting its scope, and hence I do not wish to limit myself to the exact details herein set forth.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an unloading apparatus, the combination with a leg, of a scraper carried by said leg and movable in a horizontal plane at right

angles to the longitudinal axis thereof and means for moving said scraper longitudinally.

2. In an unloading apparatus, the combination with a bucket and means for operating it, of a scraper for collecting material to within reach of the bucket, means for operating said scraper, and means independent of the vessel containing the material, for supporting and operating the scraper.

3. In an unloading apparatus, the combination with conveying apparatus and scraping apparatus independent of the conveying apparatus, for collecting material to be unloaded to a point within reach of the conveying apparatus, of means for supporting and operating both of said apparatus independently of the vessel containing the material to be unloaded.

4. In an unloading apparatus, the combination with framework and a conveyer, of a carriage mounted to move in said framework and adapted to be projected over a vessel, means for moving said carriage longitudinally, a depending leg carried by the carriage, a scraper independent of the conveyer, carried by said leg, means for operating said scraper to collect material to a point within reach of the conveyer and means independent of the scraper for operating the conveyer.

5. In an unloading apparatus, the combination with framework of a depending leg, a scraper carried by said leg, means for imparting a longitudinal sliding movement to the scraper in a horizontal plane at right angles to the longitudinal axis of the leg, and means for rotating the leg.

6. In an unloading apparatus, the combination with framework, of a depending leg, a scraper carried by said leg and adapted to have a sliding movement in a horizontal plane at right angles to the axis of the leg, means for sliding said scraper longitudinally, means for rotating the leg, and means for raising and lowering the leg.

7. In an unloading apparatus, the combination with a conveying apparatus, of a depending leg independent of the conveying apparatus, a scraper carried by said leg, means for manipulating the leg to dispose the scraper in different positions relatively to the conveying devices, and means for operating the scraper to move the material to said conveying devices.

8. In an unloading apparatus, the combination with framework, of a carriage mounted to slide in the framework and be projected over a vessel, said carriage having a hinged section, of a depending leg carried by said hinged section, a scraper carried by said leg, means for actuating the carriage, means for operating the scraper and means for raising and lowering said hinged section of the carriage.

9. An unloading apparatus comprising a frame adapted to travel parallel to the waterfront and carrying a hoisting or conveying device, and a depending leg, independent of

the hoisting and conveying device, said leg having a scraper adapted to deposit the material in a position where it can be readily reached by said independent hoisting or conveying devices.

10. In an unloading apparatus, means for collecting material in a vessel to a point within reach of a conveying apparatus, consisting of a depending leg, a scraper carried by said leg and movable in a direction transversely thereto, means for turning said leg, means for sliding the scraper longitudinally, means for moving the leg laterally, means for raising and lowering the leg and means for raising and lowering the scraper without raising or lowering the body of the leg.

11. In an unloading apparatus, the combination with conveying means, of an independent collector for moving material to a point within reach of the conveying means, consisting of a depending leg, a scraper carried by said leg, means for shifting said leg to various positions relatively to the conveying means and the material in the vessel to be unloaded and means for operating the scraper.

12. In an unloading apparatus, the combination with conveying means, of collecting

means comprising a revoluble and vertically-movable leg independent of the conveying means, a scraper carried by said leg and means within said leg for operating the scraper to move material to a point within reach of the conveying means.

13. In an unloading apparatus, the combination with a supporting-frame, a carriage thereon and a scraper-leg depending from the carriage, of a hoisting-trolley located on the frame in a vertical plane over the scraper-leg and independent hoisting and conveying devices carried by said trolley.

14. In an unloading device the combination with a movable frame, of a carriage mounted on said frame, a leg depending from the carriage, a scraper carried by said leg, means for actuating the scraper, and independent hoisting and conveying means also carried by said frame.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGE H. HULETT.

Witnesses:

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