No. 881,429. PATENTED MAR. 10, 1908.

L. A. DE MAYO.

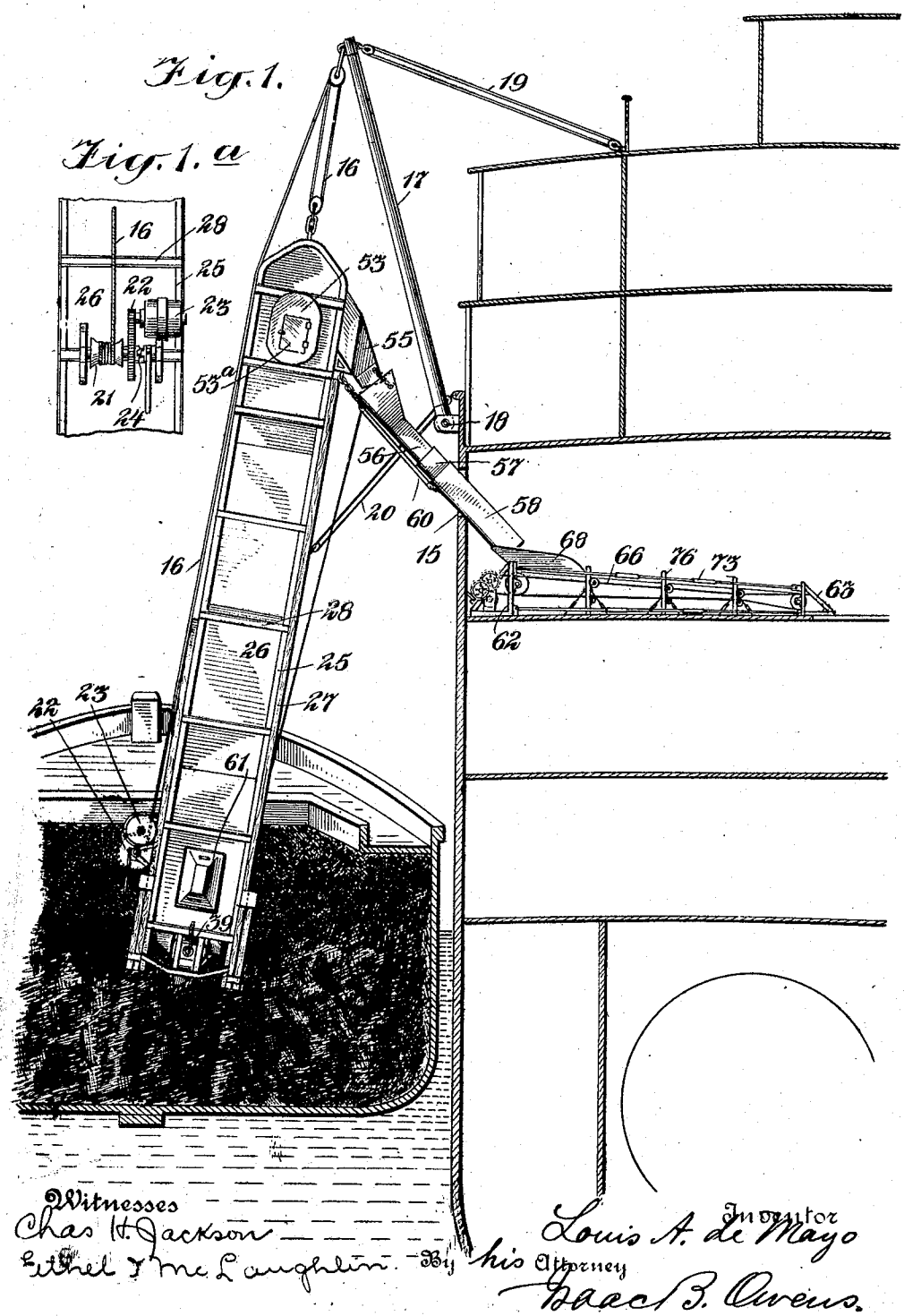
APPARATUS FOR COALING VESSELS.

APPLICATION FILED JAN. 7, 1907.

4 SHEETS—SHEET 1.

Fig. 1.

Fig. 1. a



Witnesses

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Fig. 2.

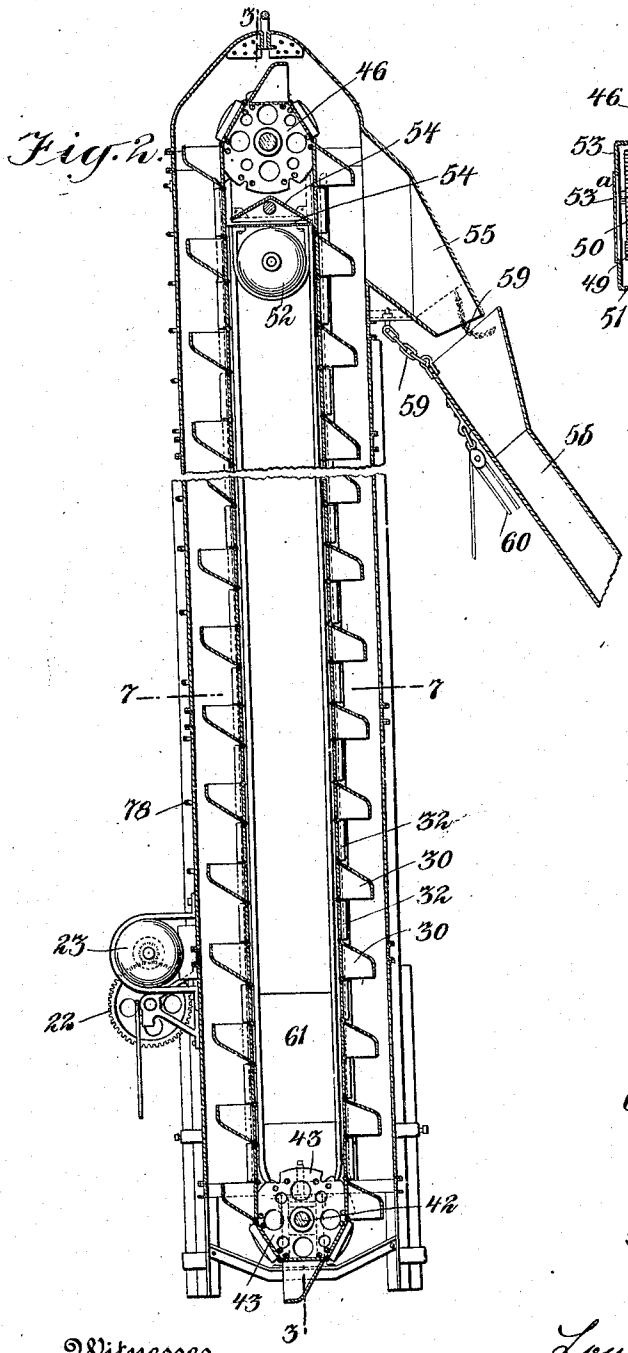
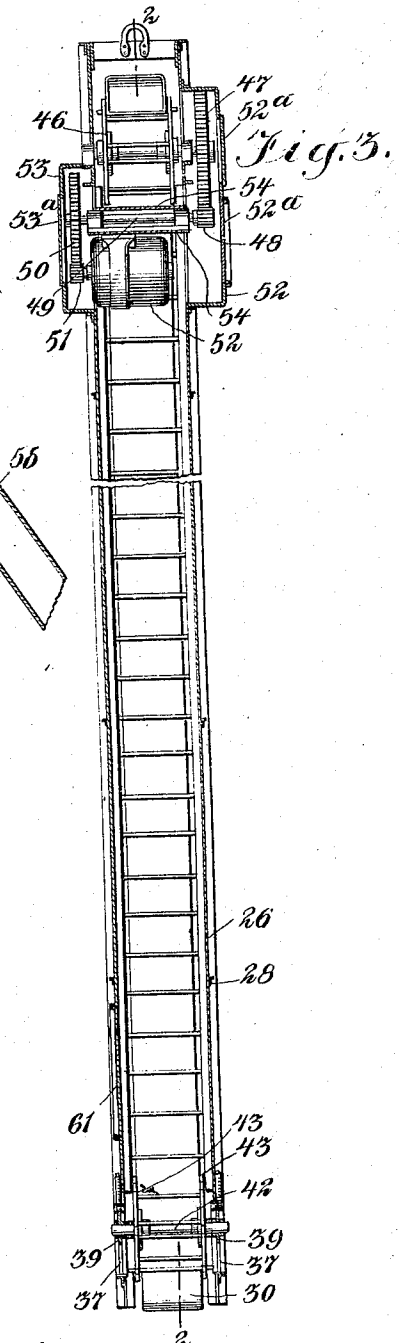


Fig. 3.



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4 SHEETS—SHEET 3.

Fig. 6.

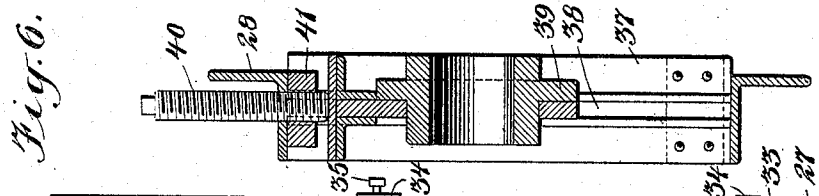


Fig. 5.

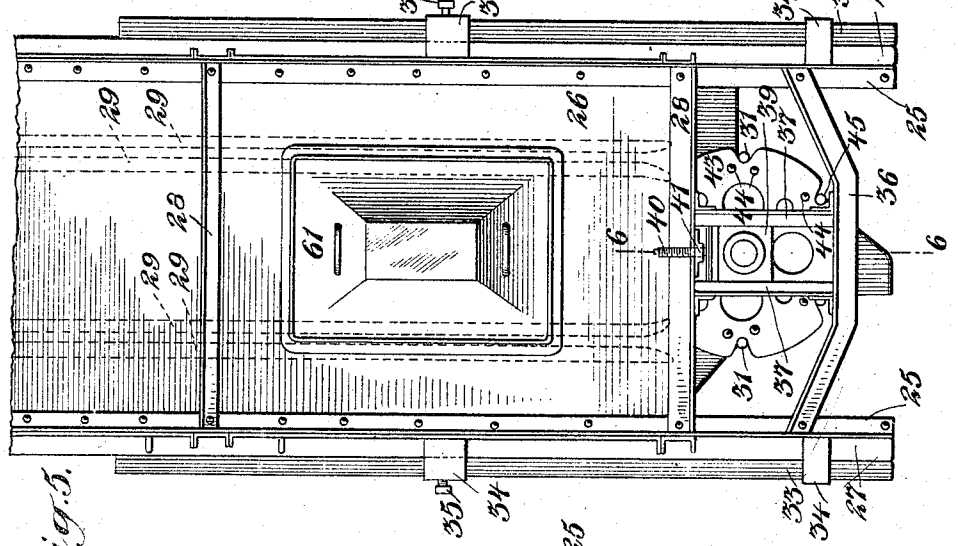
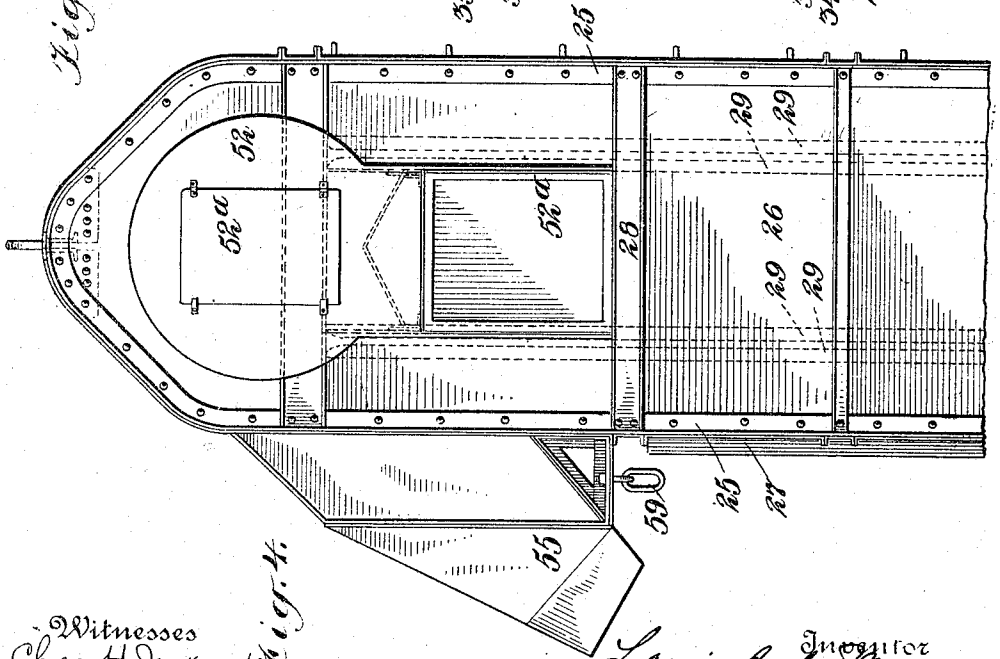


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 6.

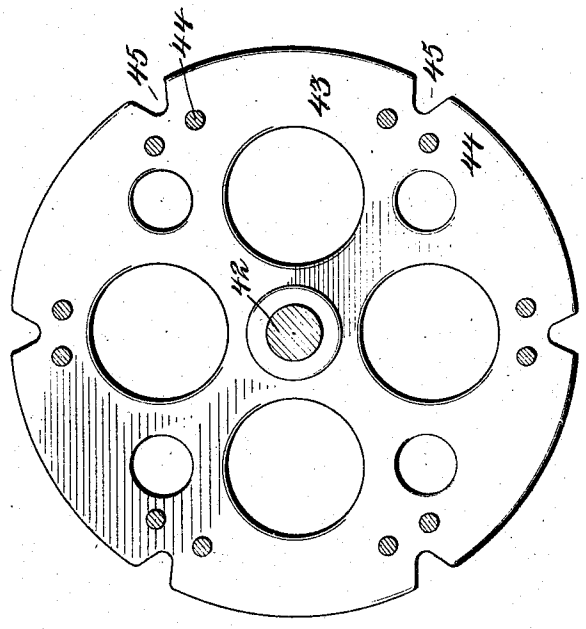
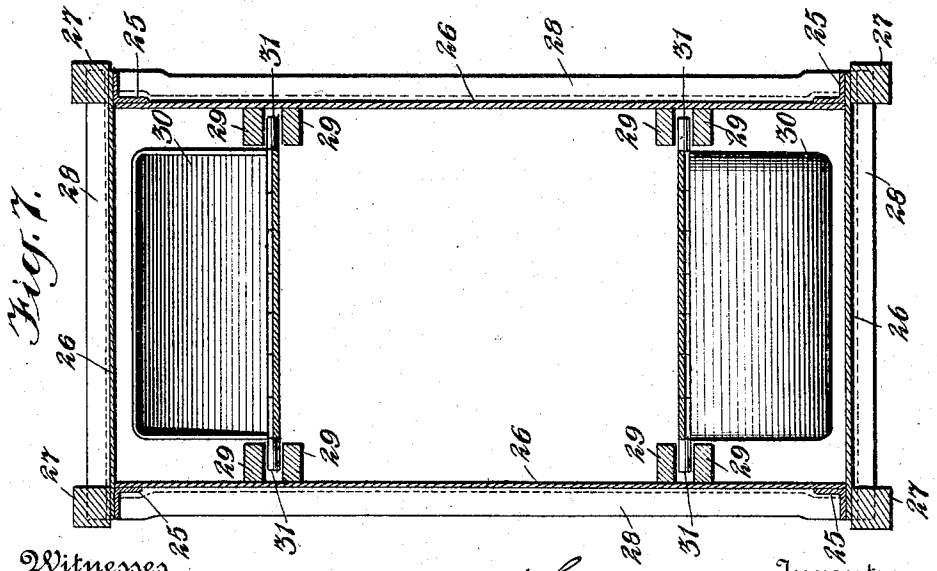


Fig. 7.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR COALING VESSELS.

No. 881,429. Specification of Letters Patent. Patented March 10, 1908.

Application filed January 7, 1907. Serial No. 351,109.

To all whom it may concern:

Be it known that I, LOUIS A. DE MAYO, of the city of New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Apparatus for Coaling Vessels, of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an apparatus for coaling vessels from lighters or barges moored alongside of the vessel.

It is especially adapted for use when the vessel is in port and making ready to go to sea.

The present invention constitutes a development of and in some respects an improvement on the apparatus forming the subject matter of my prior Patent No. 797,364, dated August 15, 1905. This apparatus as may be seen by reference to the prior patent comprises in its general design, an elevator which is hung by a tackle from a davit or boom of the vessel and the lower end of which is adapted to enter the coal barge, the coal being raised by the buckets of the elevator and delivered to the chute from which it is discharged through the coaling port of the vessel into the bunkers thereof. The improved apparatus constituting the subject matter of the present application is of the same generic character.

An important object of my improvement is to increase the ease with which the elevator may be handled, enabling me to change its location when at work readily and without a material loss of time. In accomplishing this result I mount a motor on the frame of the conveyer and this motor is geared with a winding drum by means of which drum the fall of the tackle supporting the elevator, may be hauled at will, thus enabling the elevator to be raised or lowered by machine power forming an integral part of the machine itself as contradistinguished from a hoisting engine on the vessel or on the dock or pier at which the vessel may be lying.

A further object is to provide means for adjustably supporting the lower end of the conveyer in the bed of coal or on the bottom of the barge, thus preventing the conveyer from sinking too deeply in the coal bed. In effecting this result I provide the longitudinal beams of the elevator frame with guide devices and in these guide devices extension legs are adjustable. These legs may be projected any desired distance below the lower end of the conveyer thus enabling the apparatus to be adapted at all times to the varying conditions under which it must be worked.

A further object of my invention is to improve the frame of the elevator and to provide means enabling this to be constructed in the form of an inclosing housing which forms a tight cover for the elevator buckets and prevents the escape of the coal dust thus overcoming a great obstacle incident to systems of coaling heretofore employed, to wit, the escape of large volumes of coal dust which soils everything in the vicinity. I also combine with this peculiarly constructed frame, improved devices for mounting the drum around which the endless conveyer runs and for adjusting the boxes of these drums so as to regulate the tension of the conveyer.

Still a further object of my invention is so to construct the chute through which the coal is discharged, that the chute may be adjusted easily to increase or diminish its length, thus suiting it to all ships and so also as to prevent any escape of coal dust, forming a tight adjustable passage-way insuring the rapid delivery of the coal and avoiding all dust from the same.

My invention involves various other features of major or minor importance, and all will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is now had to the accompanying drawings which illustrate as an example one manner in which the principles of my invention may be embodied, in which drawings:—

Figure 1 is a view showing a partial cross section of a modern ocean going steamer and of a coal barge lying alongside of the same, my improved coaling apparatus being illustrated in operative position; Fig. 1ª is a detail elevation showing the motor and hoisting drum applied to the frame of the elevator. Fig. 2 is a longitudinal section of the elevator on the line 2—2 of Fig. 3, showing the frame or housing and the adjacent parts; Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2; Fig. 4 is an enlarged elevational view of the upper end of the elevator; Fig. 5 is a similar view of the lower end of the elevator; Fig. 6 is an enlarged section on

the line 6—6 of Fig. 5, showing the manner of adjustably mounting the lower elevator drum; Fig. 7 is an enlarged cross section on the line 7—7 of Fig. 2; and Fig. 8 is an enlarged cross section of one of the drums over which the elevator runs.

In Fig. 1, 15 indicates the usual coaling port in the side of the vessel. Modern vessels are usually provided with a number of such ports which lead into various of the coal bunkers or compartments. The coal is raised from the barge shown in Fig. 1 and introduced into the hold of the vessel through said port 15. The coaling apparatus is sustained by the tackle 16 from a boom 17 or other support on the vessel or on the pier at which the vessel may be lying or if desired from a support on the barge itself. I prefer, however, to sling the elevator from a boom such as is shown at 17, the lower end of the boom is sustained in any suitable manner on the hull or rail of the vessel as indicated at 18 and its free end is connected to a tackle 19 by which it is held. The elevator is guyed by side tackles 20 preferably passing from the elevator to the ship. In this manner the elevator is sustained in upright position with its lower end dipping into the barge. The fall of the tackle 16 extends down the side of the elevator and is wound over a drum 21 mounted on the frame or housing near the lower end thereof. This drum is connected by a gearing 22 (see Fig. 1[a]) with the motor 23, a clutch 24 being provided by which the drum may be thrown in and out of the gear at will. To raise the elevator therefore, to suit the height of coal in the barge, it is only necessary to start the motor 23 and throw in the clutch 24. This enables me to adjust the apparatus easily and avoids dependence upon manual labor for this work. The motor 23 is preferably, though not necessarily, electric.

The frame of the apparatus as shown best in Fig. 7 is formed of angle iron beams 25 preferably four in number and running longitudinally of the elevator. These beams are fastened to metal plates 26 extending between them and forming an inclosure, rectangular in cross section. At each corner of this inclosure, a wooden beam is arranged, these beams 27 coacting with the beams 25 in the formation of a light, durable structure. On its outer sides this housing is provided with cross braces 28 also of metal which resist crushing strains, and serve also to strengthen this support of the pairs of longitudinal guide rails 29. These rails are arranged within the housing and are extended longitudinally thereof as indicated in Figs. 2 and 7, and they serve as guides for the buckets 30 of the elevator, the pairs of rails receiving between them, studs 31 which project from the pintles hinging together the buckets 30 and link plates 32 alternating between the buckets. 61 indicates a manhole and cover in the lower part of the housing permitting access to be had to the interior thereof. I also prefer to place on the exterior of the housing ladder rungs 78 enabling workmen to ascend to the upper end of the housing.

The elevator as shown best in Fig. 2 is made up of the alternate buckets and link plates hinged together and the studs 31 are preferably continuations or extensions of the pintles joining these parts. By this arrangement the elevator buckets are caused to run true in the housing and are prevented from crashing against the sides thereof, which would not only retard the movement of the elevator but tend to destroy its parts. The angle iron beams 25 and wooden beams 27 project below the lower end of the housing, forming legs and these legs are provided with extensions 33 which are held to slide longitudinally of the frame in guides 34, 35 indicating set screws or other desired means by which the extension legs may be held at various adjustments. The use of these extension legs is shown in Fig. 1, where the legs are projected below the frame to engage the bottom of the barge thus assisting the tackle 16 in sustaining the elevator in the proper position and preventing the elevator from dipping into the coal bed to an excessive depth. Extending between the legs 25 at opposite sides of the apparatus are transversely extending beams 36. These beams have attached thereto at each side of the machine, two upwardly extending guide rails 37 formed with ways 38 therein as shown best in Fig. 6. Said guide rails 37 extend and are fastened to the lowermost cross bars 28 and receive between them sliding boxes 39 in which the journals of the lower elevator drum are carried. The boxes 39 are adjustably held by means of screws 40 which work in nuts 41 secured to the undersides of the lowermost beams 28. The journals of said drum as shown best in Fig. 3 are formed by extensions of the shaft 42 of the drum. The drum itself (see Figs. 2, 3 and 8) is formed of two webs 43 fastened on the shaft 42 and held in fixed relation to each side by means of pairs of tie rods 44. These tie rods are located near the peripheries of the webs opposite notches 45 therein. The notches 45 serve to receive the extensions or studs 31 of the pintles connecting the link plates 32 and buckets 30, and the tie rods 44 not only hold the webs 43 in fixed relation but also serve to be engaged by the link plates and buckets which run between the webs 43. The webs 43 here shown are orificed to lighten the structure, but if desired these webs may be replaced by a hub, spoke and rim construction to which the construction shown in the drawing is obviously equivalent.

The upper end of the elevator is carried

on a drum 46 which is equivalent in construction to that of the lower drum. The upper drum serves to drive the elevator and this drum itself is driven through a spur gear 47 fastened to the shaft of the drum and meshed with a pinion 48. This pinion is secured to a shaft 49 which extends across the upper portion of the frame or housing and carries a spur gear 50 meshed with a pinion 51 on the shaft of an electric or other motor 52. This reducing gear drives the drum from the motor at the proper speed, which may be determined readily by the proportions of the gearing. The gears 47 and 48 at one side of the apparatus are inclosed in a case 52 and the gears 50 and 51 at the other side are inclosed in a case 53. These gear cases have manholes and covers 52^a and 53^a facilitating access to the interior of the cases. The shaft 49 is inclosed between protecting plates 54 (see Figs. 2 and 3) and said plates serve also to shelter the motor from particles of coal falling from the top of the elevator.

The housing has a spout 55 projecting from its upper end and this spout is designed to receive the coal raised by the buckets. As the buckets reach the vertical position at the top of the elevator, the contents of the buckets are discharged upon the preceding link plates 32, the coal sliding over the plate and thus passing over the bottom of the preceding bucket which being inclined toward the spout 55 serves as a chute dumping the coal into said spout. From the spout 55 the coal passes into the adjustable discharge chute. This as shown best in Fig. 1 is made up of three tubular, telescopic sections 56, 57 and 58, the upper sections 56 having an enlarged receiving end. The chute is held in position to form a continuation of the spout by means of chains 59 which are fastened to the spout and the upper part of the frame of the elevator. The two end sections 56 and 58 of the chute are connected by a tackle 60, the fall of which passes down and is fastened to the frame of the apparatus at any convenient point. This tackle limits the extending movement of the chute and the length of the chute, therefore, may be readily varied to suit the conditions under which the apparatus may be working.

The coal raised by the elevator and discharged through the chute is deposited upon the distributing or trimming conveyer 66 which is shown in Fig. 1. This conveyer may, as far as my present application is concerned, be of any desired form and serves to distribute the coal in the hold of the ship.

In the operation of the apparatus the parts are adjusted as in Fig. 1 and the motor 52 is set in operation. The lifting buckets 30 begin to travel filling with coal at the lower end of the elevator and discharge out through the spout and chute as described. From the chute, the coal passes into the hopper 68 and thence onto the distributer 66 which dumps the coal through the hatch or deposits it at any other point desired.

It should be understood that my invention is not limited in its use to the exact connection shown in the drawings; for example, it may be made to coal into the main hatch on the deck of the vessel, when it is not convenient to introduce the coal through coal ports in the sides. In this case suitable conveyers or distributers such as the distributer 66 should be placed on the main deck of the vessel and the elevator made to discharge on the conveyer. If desired a number of conveyers may be used, they being arranged to carry the coal along the deck from one conveyer to the other over any course desired.

Having thus described the preferred embodiment of my invention what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In an apparatus for coaling vessels, the combination of an elevator, a boom adapted to be secured to a vessel a tackle adapted to be secured to the boom and to the top of the elevator, and a winding mechanism mounted on the elevator and connected with the fall of the tackle.

2. In an apparatus for coaling vessels, the combination of an elevator, means secured to the top thereof for adjustably sustaining the same, and an operating device mounted on the elevator and connected with said means for adjustably sustaining it.

3. In an apparatus for coaling vessels, the combination of an elevator, a tackle by which said elevator is suspended, a winding drum mounted on the elevator and engaging the fall of the tackle, a motor also mounted on the elevator and gearing for driving the drum from the motor at will.

4. In an apparatus for coaling vessels, the combination of a boom stepped on the hull, a tackle connected to the free end of the boom to hold it in position, an elevator, a tackle sustaining the elevator from the boom and means on the elevator for operating the tackle.

5. In an apparatus for coaling vessels, the combination of a boom stepped on the hull, a tackle connected to the free end of the boom to hold it in position, an elevator, a tackle sustaining the elevator from the boom and a winding mechanism mounted on the elevator and engaging the fall of the tackle.

6. In an apparatus for coaling vessels, the combination of a housing, an elevator therein, a tackle at the upper end of the housing for sustaining it, a winding device mounted on the housing and connected with the fall of the tackle and an adjustable sustaining means at the lower end of the housing.

7. An apparatus for coaling vessels, having an elevator and a housing inclosing the same,

the housing being rectangular in cross section and constructed of longitudinal corner beams of metal, side plates fastened to said beams and wooden beams secured to the corners of the housing.

8. An apparatus for coaling vessels, having an elevator and a housing inclosing the same, the housing being rectangular in cross section and constructed of longitudinal corner beams of metal, side plates fastened to said beams, wooden beams secured to the corners of the housing and cross beams extending alongside of the side plates and fastened to the corner beams.

9. An apparatus for coaling vessels, having an elevator composed of buckets and alternating connecting members hinged together, the pintles of the hinges being extended to form studs, and a drum over which the elevator passes, the drum being composed of side webs engaged by the studs, and connecting bars extending between the side webs and engaged by the elevator as the same passes between the side webs.

10. An apparatus for coaling vessels, having an elevator composed of buckets and alternating connecting members hinged together, the pintles of the hinges being extended to form studs, a drum over which the elevator passes, the drum being composed of side webs engaged by the studs, connecting bars extending between the side webs and engaged by the elevator as the same passes between the side webs, and a guiding means within the housing and also engaged by the studs.

11. An apparatus for coaling vessels, comprising a housing, an elevator running therein, drums over which the elevator moves, a motor mounted in the housing beneath the upper drum, an intermediate shaft passing between the motor and said upper drum and gearing connecting the shaft with the motor and with the upper drum and a cover plate extending between said upper drum and the shaft and motor for the purpose specified.

12. In an apparatus for coaling vessels, the combination of an elevator, a framing on which it is mounted, a motor carried by the framing for driving the elevator, means for adjustably suspending the frame in vertical position, and an adjustable supporting leg attached to the frame at its lower end.

13. In an apparatus for coaling vessels, the combination of an elevator, a framing on which it is mounted, a motor carried by the framing for driving the elevator, means for adjustably suspending the frame in vertical position, an adjustable supporting leg attached to the frame at its lower end, and a second motor mounted on the frame and connected with said means for adjustably suspending it.

14. An apparatus for coaling vessels having a housing, an elevator therein, the housing being angular in cross section and having longitudinal corner beams, guides secured to the housing directly adjacent to the corner beams, legs adjustably carried by the guides alongside the corner beams and means for adjustably suspending the housing.

15. In a portable apparatus of the class described, a framing, a housing supported thereby, longitudinal guides arranged in said housing, an endless elevator also arranged in said housing, drums associated with said housing and over which said elevator runs, said elevator comprising buckets and connecting members alternately arranged and hinged together, the pintle rods of the hinges of said elevator projecting beyond the edges of the latter and working within said guides to direct the movement of the elevator, and a motor carried by said framing for operating said elevator.

16. In a portable apparatus of the class described, a framing, a housing supported thereby, longitudinal guides arranged in said housing and disposed in pairs at the inner sides of two opposite walls thereof, an endless elevator also arranged in said housing, drums associated with said housing and over which said elevator runs, said elevator comprising buckets and connecting members alternately arranged and hinged together, the pintle rods of the hinges of said elevator projecting beyond the edges of the latter and working within said guides, whereby both runs of the elevator are guided at both sides of the housing to direct the movement of the elevator, and a motor carried by said framing for operating said elevator.

17. In a portable apparatus of the class described, a framing, a housing supported thereby, longitudinal guides arranged in said housing, an endless elevator also arranged in said housing, drums associated with said housing and over which said elevator runs, each of said drums having side webs, said elevator comprising buckets and connecting members alternately arranged and hinged together, the pintle rods of the hinges of said elevator projecting beyond the edges of the latter and working within said guides to direct the movement of the elevator, the projecting portions of the pintles engaging the webs of the drums in the travel of the elevator, and a motor carried by said framing for operating said elevator.

18. In a portable apparatus of the class described, a framing, a housing supported thereby, longitudinal guides arranged in said housing, an endless elevator also arranged in said housing, drums associated with said housing and over which said elevator runs, each of said drums having side webs provided with notches, said elevator comprising buckets and connecting members alternately arranged and hinged together, the pintle rods of the hinges of said elevator projecting

beyond the edges of the latter and working within said guides to direct the movement of the elevator, the projecting portions of the pintles engaging the notches of the webs of the drums in the travel of the elevator, and a motor carried by said framing for operating said elevator.

19. An apparatus for coaling vessels, having a housing composed of longitudinal corner beams and side plates attached thereto, the corner beams being projected below the side plates at the bottom of the housing, transverse beams connecting the extended lower ends of the corner beams, cross beams connecting the corner beams at the lower edges of the side plates, parallel guide rails extending between the transverse beams and the cross beams boxes adjustably arranged between the guide rails, a drum mounted in the boxes and an elevator running over the drum.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS A. DE MAYO.

Witnesses:
M. PRIMICH,
DONALD FINDLEY.