L. LOMBI.

APPARATUS FOR COALING SHIPS AND THE LIKE.

APPLICATION FILED JULY 17, 1919.

1,373,436. Patented Apr. 5, 1921.

5 SHEETS—SHEET 1.

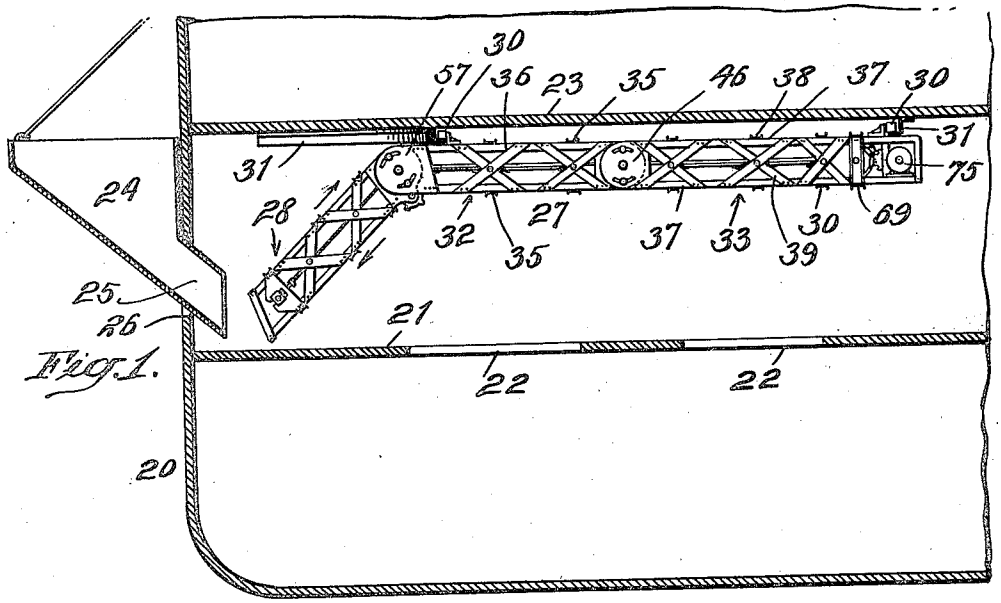


Fig. 1.

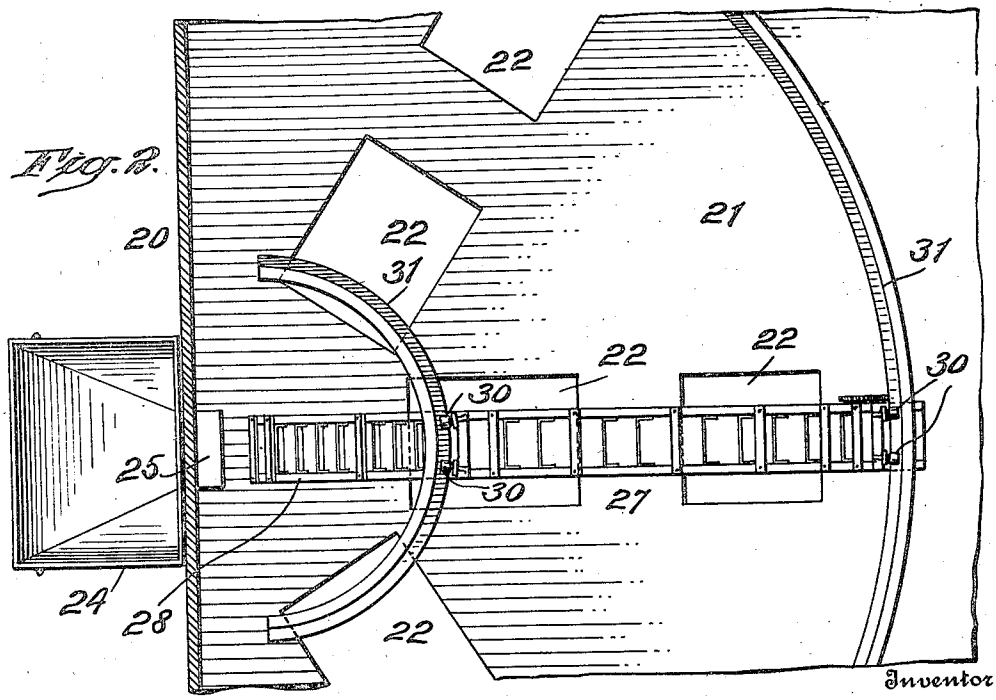


Fig. 2.

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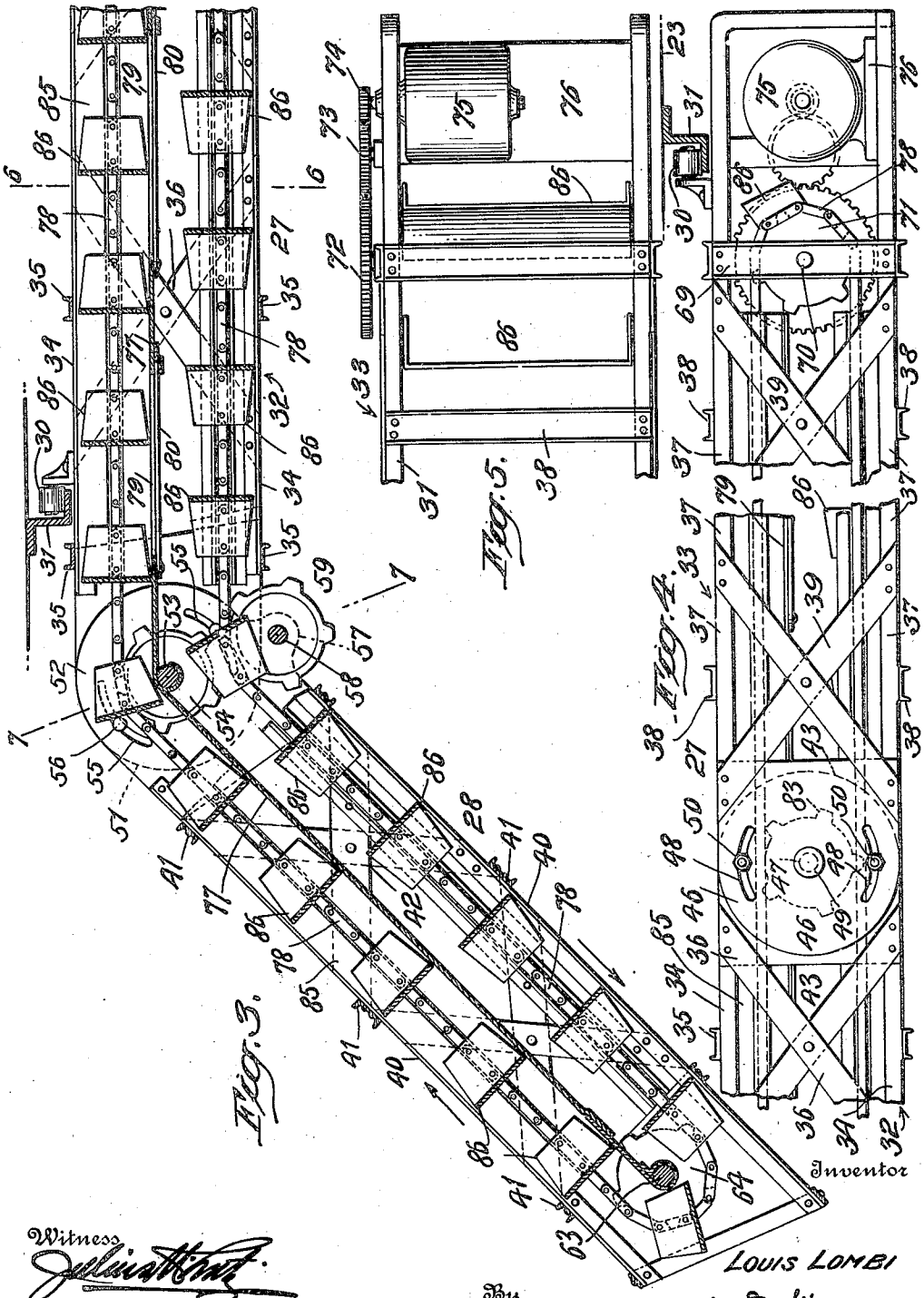


Fig. 3.

Fig. 5.

Fig. 4.

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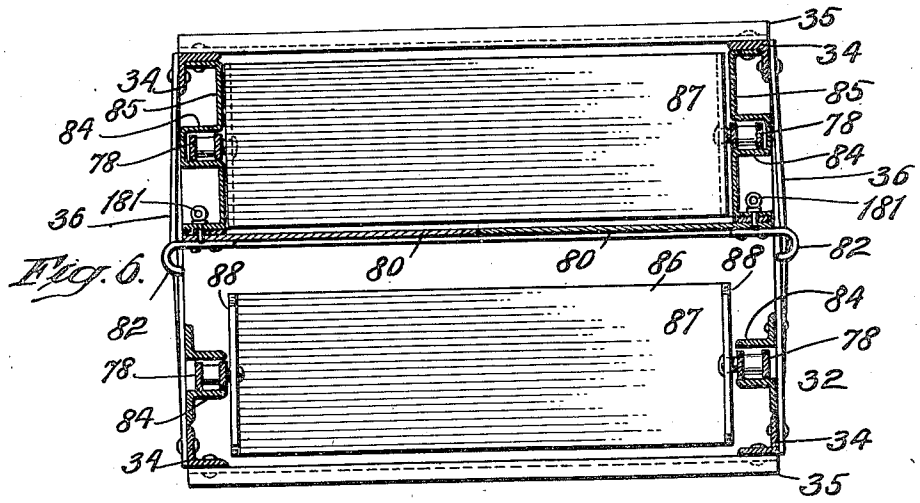


Fig. 6.

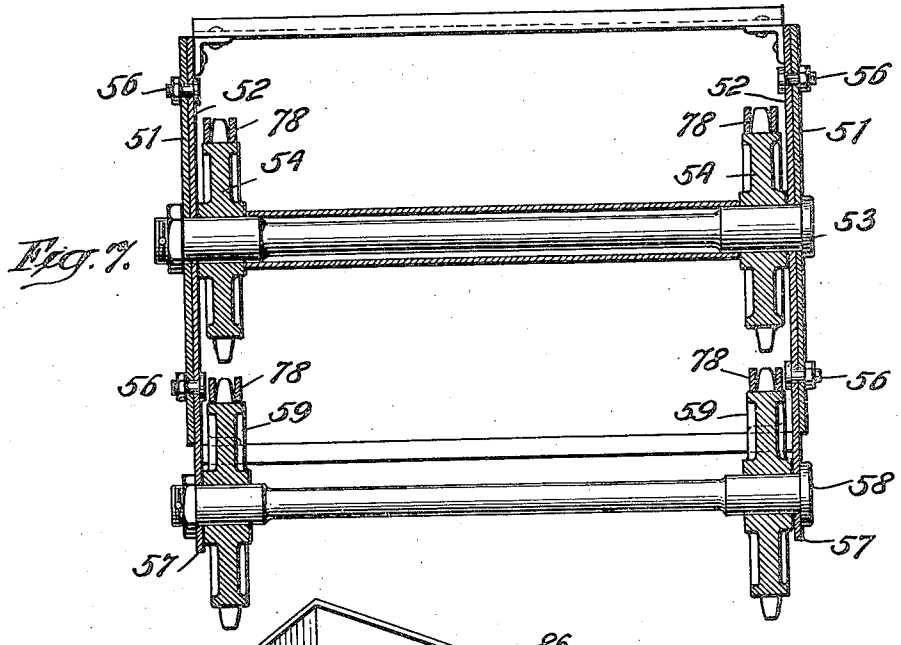


Fig. 7.

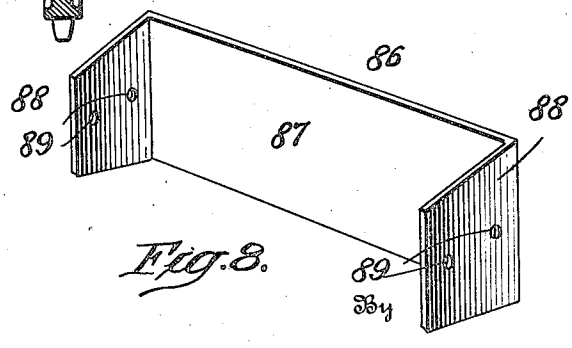


Fig. 8.

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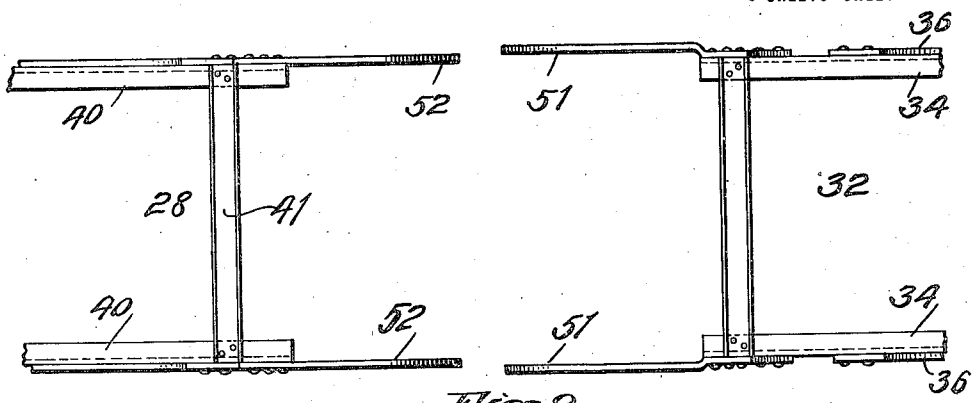


Fig. 9.

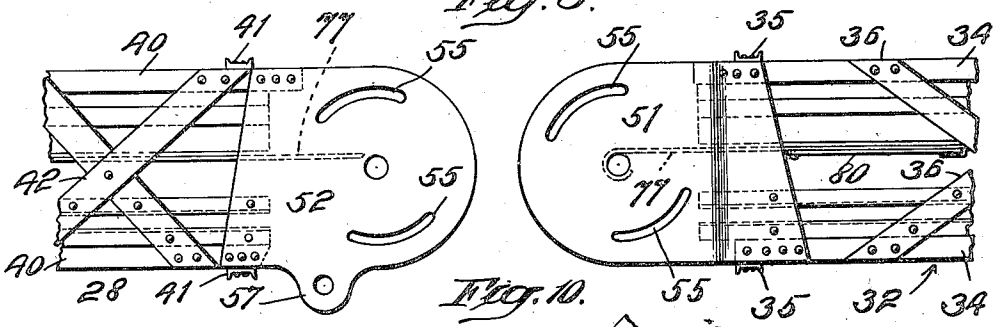


Fig. 10.

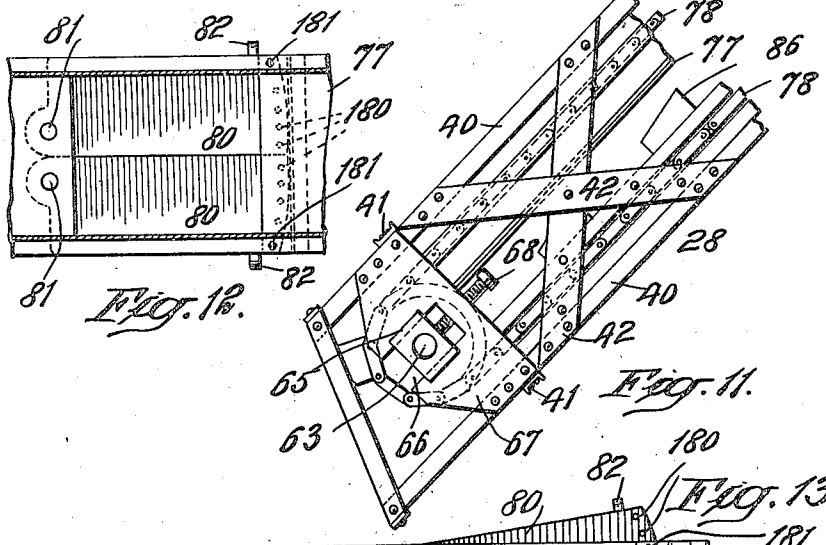


Fig. 12.

Fig. 11.

Fig. 13.

Witness

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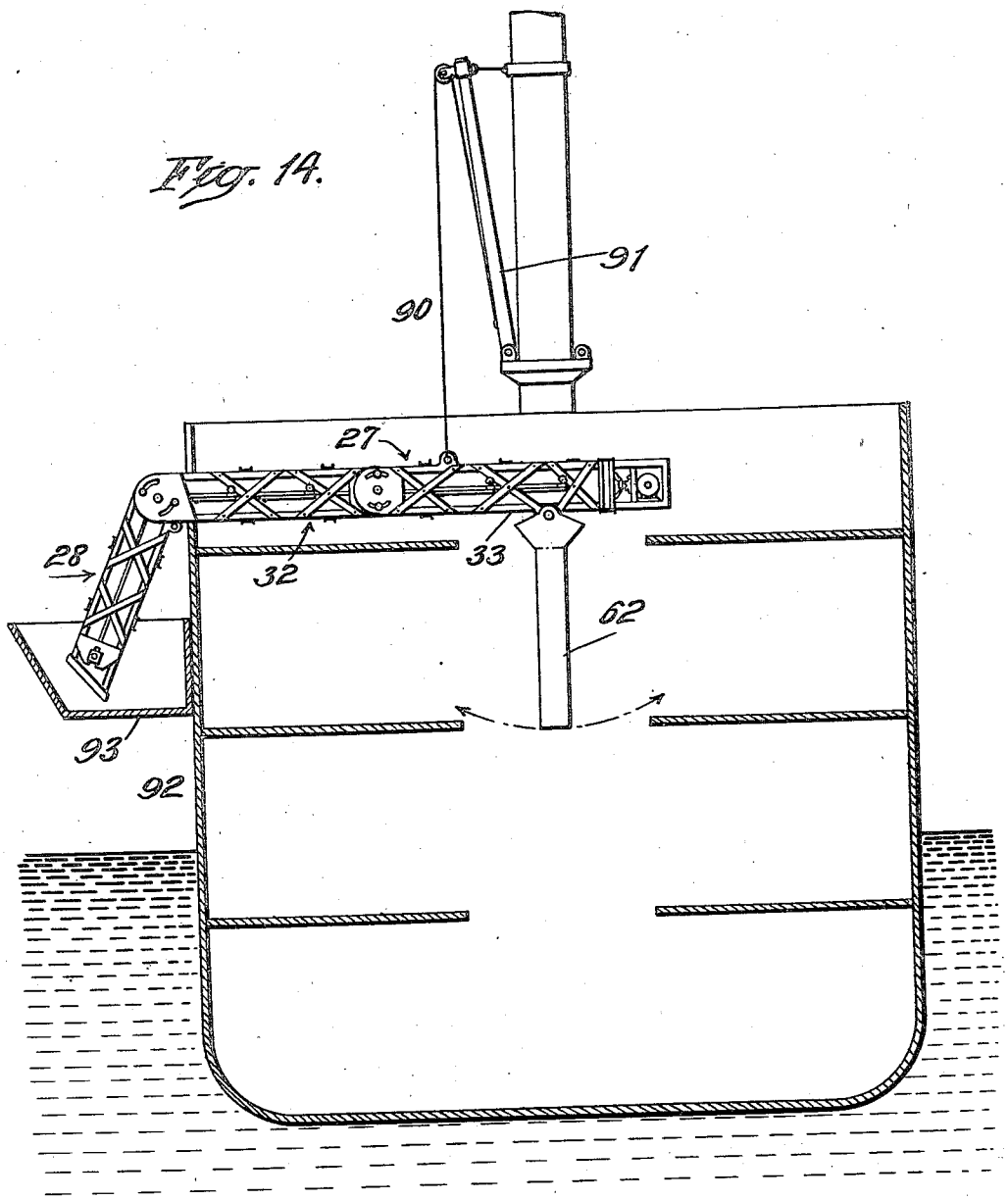
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5 SHEETS—SHEET 5.

Fig. 14.



Inventor
LOUIS LOMBI

By his Attorney
Chas. C. Gill

UNITED STATES PATENT OFFICE.

LOUIS LOMBI, OF NORTH BERGEN, NEW JERSEY.

APPARATUS FOR COALING SHIPS AND THE LIKE.

1,373,436. Specification of Letters Patent. Patented Apr. 5, 1921.

Application filed July 17, 191.. Serial No. 311,444.

To all whom it may concern:

Be it known that I, LOUIS LOMBI, a citizen of the United States, and a resident of North Bergen, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Coaling Ships and the like, of which the following is a specification.

The invention relates to conveyers for handling material and conveying the same from one point to another, and while my invention is useful for many purposes I have designed the same more particularly for coaling ships, one object being to provide suitable apparatus for distributing coal to the several bunkers of ships in a manner to avoid the expense and hard labor incident to the "trimming" of the bunkers by manual labor.

The apparatus of my invention comprises a suitable supporting frame, an endless traveling conveyer mounted therein, a flooring or partition over which the coal is moved by the upper stretch of the conveyer, gates mounted in said flooring for permitting the discharge of the coal at any of several points according to the requirements of the bunkers, pivotal means for adjusting the elevator leg with relation to the main section of the conveyer frame, means for permitting the turning of the conveyer frame laterally to one side or the other as occasion may require and other advantageous features of arrangement and construction, all of which will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a vertical transverse section through a portion of a ship equipped with the coaling apparatus of my invention;

Fig. 2 is a horizontal section through the same, the conveyer frame supporting deck, hereinafter designated by the numeral 23, being omitted and the apparatus of my invention being shown in plan view;

Fig. 3 is a central vertical longitudinal section, partly broken away, of the conveyer apparatus of my invention;

Fig. 4 is a side elevation, partly broken away, of an intermediate portion and the inner end portion of the same;

Fig. 5 is a plan view of the inner end portion of the same and illustrates more particularly the mechanism for driving the endless conveyer;

Fig. 6 is a vertical transverse section through the conveyer taken on the dotted line 6—6 of Fig. 3;

Fig. 7 is a transverse section through the conveyer frame taken on the dotted line 7—7 of Fig. 3;

Fig. 8 is a perspective view of one of the conveyer-chain frames or scrapers for moving the coal along through the main frame;

Fig. 9 is a plan of portions of adjacent sections of the conveyer frame, said sections (one being the elevator leg section and the other the main frame section) being shown as separated from each other and ready to be assembled or joined together;

Fig. 10 is a side elevation of the same;

Fig. 11 is a side elevation of the lower end portion of the inclined elevator or leg section of the conveyer and is presented to illustrate the means for keeping the conveyer-chains taut;

Fig. 12 is a horizontal section through a portion of the upper part of the conveyer frame and illustrates, more particularly, a pair of pivoted gates which I provide at convenient points in the flooring over which the coal is moved to its place of discharge, said gates being shown in closed position;

Fig. 13 is a like view of the same, with the gates shown as having been opened outwardly from each other so as to permit the discharge of the coal between them, and

Fig. 14 is a vertical transverse section through a portion of a ship, with the apparatus of my invention shown as having its inclined leg extended into a hopper which is exterior to the side of the ship, as distinguished from the method represented in Fig. 1 for mounting the apparatus.

I will first describe the construction shown in Figs. 1 to 13 inclusive.

In the drawings, 20 designates a portion of a ship, diagrammatically illustrated; 21 a lower deck having openings 22 therein for the passage of the coal, 23 an upper deck over the bunkers, and 24 a hopper removably supported at the side of the ship and having a spout 25 extended through a hole 26 in the side of the ship and adapted to discharge the coal upon the deck 21 in convenient position to be taken up and away by the apparatus of my invention. The hopper 24 may receive the coal from any source, as, for instance, from an elevator, not shown, employed to unload the coal from a barge.

The conveying apparatus of my invention comprises a main frame-section 27 and a leg or elevator inclined frame-section 28, the two sections being hinged together, as presently explained, and the main frame-section is supported by rollers 30 upon segmental tracks 31 which are secured to the lower side of the deck 23. As many rollers 30 and tracks 31 may be used as occasion may require, and their purpose is to support the conveyer apparatus and permit the same to be turned laterally to one side or the other so as to discharge the coal into the various openings 22, the coal being thereby distributed to the bunkers in the manner required for trimming the bunkers.

I preferably form the main frame 27 in two joined-together sections 32, 33 for purposes of convenience in construction, manipulation, storage and the like. The section 32 is rectangular in cross-section and composed of corner-angle irons 34 connected by transverse upper and lower channel beams 35 and by crossed side braces 36, these channel irons and crossed braces being riveted to the horizontal and vertical members respectively of the angle-irons 34, as shown more particularly in Figs. 4 and 6. The general frame of the section 33 corresponds with the general frame of the section 32 in that it is composed of corner angle-irons 37 connected by upper and lower transverse channel beams or bars 38 and side crossed braces 39. The elevator leg 28 corresponds, as to its general frame, with the structural features of the frame-sections 32, 33 in that the frame of said leg 28 is formed of upper and lower corner angle-iron members 40 connected by upper and lower transverse channel beams 41 and side crossed-braces 42.

At their adjoining end portions the frame-sections 32, 33 have side matching plates secured to them, the plates for the frame section 32 being numbered 43 and being riveted to the angle-iron corner members of said frame section 32 (Fig. 4). The plates 43 have a central hole to receive a pivot-rod or shaft 49 and also upper and lower segmental slots provided for adjusting screws 50. The plates secured to the inner end of the frame section 33 are numbered 46 and riveted to the upper and lower angle-iron members of said frame-section 33. The plates 46 have central holes 47 and segmental slots 48 to match the aforesaid holes and slots in the plates 43, the holes matching to receive the pivot pin or bolt 49, as shown in Fig. 4, and the segmental slots matching to receive binding screws 50, 50. By reason of the said segmental slots and the said screws, the frame sections 32, 33 may at their adjoining ends be turned upwardly or downwardly, as occasion may require, or separated from each other to permit an additional frame-section to be interposed between them. The plates 43, 45 correspond with the plates 51, 52, shown in detail in Figs. 7, 9 and 10, for connecting the leg 28 with the main frame-section 32.

At its outer end adjacent to the upper end of the inclined leg 28, the frame section 32 has plates 51 riveted to its sides, and at the same location the upper end of the leg 28 has matching plates 52 riveted to its sides, and these plates 51, 52 overlap and are connected together by the shaft 53 for the sprocket-wheels 54 (Fig. 7). The plates 51, 52 are formed with matching segmental slots 55 to receive adjusting screws 56, these slots and screws permitting of the angular adjustment of the leg 28 so that said leg may be given the desired inclination and then secured in that relation by means of the set-screws 56. The leg 28 hangs on the axle or shaft 53 and may be turned thereon when the screws 56 are loosened and then secured rigidly by the tightening of said screws. The plates 52 have downwardly projecting ears 57 to receive and support the axle or shaft 58 on which lower sprocket-wheels 59 are mounted, these sprocket-wheels 59 matching the upper sprocket-wheels 54.

At the lower end of the leg 28 is mounted a transverse shaft 63, upon which are mounted a pair of sprocket-wheels 64. The ends of the shaft 63 are mounted in bearing blocks 65 which are adapted to slide in guide-ways 66 formed in plates 67 secured to the opposite sides of said leg 28 (Fig. 11). The bearing-blocks 65 are connected to adjusting screws 68, by means of which in a well-known manner the shaft 63, bearing blocks 65 and sprocket-wheels 64 may be adjusted for the purpose of keeping the conveyer chains, hereinafter described, taut.

At the outer or far-end of the frame-section 33 I mount in vertical channel bars 69 a transverse shaft 70, and upon this shaft 70 I secure a pair of sprocket-wheels 71 for the conveyer chains. Upon one end of the shaft 70 is secured a gear-wheel 72, and this gear-wheel 72 is connected by gears 73, 74 with the driving shaft of an electric motor 75, said motor being mounted on a platform 76 between the sides of the frame-section 33, which sides are extended beyond the sprocket-wheels 71 to arrange for the motor 75.

The entire framing of the conveyer is subdivided into upper and lower sections by a transverse partition or flooring 77, and one stretch of the sprocket-chains will travel inwardly through the upper section or compartment formed by said partition or flooring 77 and the lower stretch travel outwardly through the lower section of the framing formed by said partition 77. The coal is conveyed upwardly and inwardly upon the partition or flooring 77 and dis-

charged at any convenient point or points through openings 79 formed in said flooring, said openings 79 being opened more or less as occasion may require by means of pivoted gates 80, Figs. 12 and 13, said gates being flat plates pivotally secured by rivets 81 to the flooring 77 and being provided near their front ends with hook-shaped handles 82 by means of which said gates 80 may be manually operated. The openings 79 and gates 80 are spaced along the flooring 77 so that they may, one after another, be made use of in filling the bunkers in accordance with the location of the openings 22 formed in the decks of the ships. I regard the pivoted gates 80 as important, since they constitute fixed portions of the apparatus and may be opened more or less as required. When both of the gates are opened, the discharge of the coal is centrally between them, but when required, as in properly trimming the bunkers, either gate may be opened and the other remain closed. When the gates 80 are in closed position or even in adjusted position, they should be locked against accidental movement, and to this end I provide along the outer edge of each gate a segmental series of holes 180 (Figs. 12 and 13) to receive vertical locking pins 181 (Fig. 6) which may be passed downwardly through openings in the lower flanged portions of the cheek plates 85 and through said holes 180 in the gates 80, the pins 181 being ordinary mechanical means for securing the gates 80 in their several positions.

The sprocket-chains 78 are two in number, one being at each side of the general framing of the conveyer apparatus, and said sprocket-chains 78 travel on the pairs of sprocket-wheels 64, 54, 71 and 59 and also on, when desired, sprocket-wheels 83, a pair of which I mount on the rod or shaft 49 which connects the plates 43, 46 at the adjacent ends of the frame-sections 32, 33, as indicated by dotted lines in Fig. 4, power being imparted to said chains from the sprocket wheels 71 and motor 75. The sprocket-chains 78 are guided in housings or supports 84 (Fig. 6) at the sides of the main frame of the apparatus. Above the flooring 77 I secure to the main and leg frames, side cheek-plates 85 (Fig. 6) so that the coal moved along said flooring may not interfere with the sprocket chains and may also not escape through the sides of the main frame, said cheek plates serving to confine the coal upon the flooring 77 until the coal reaches its point or points of discharge. The cheek plates 85 are not required below the flooring 77 because on the return movement of the lower stretch of the chains no coal is carried along by or the parts connected with them.

I secure to the facing sides of the chains 78 a series of spaced apart frames or scrapers 86, one of which is shown in detail in Fig. 8. The frames 86 comprise a transverse scraper blade 87 and right-angularly disposed end plates 88, and these end plates 88 each contain two rivet openings 89 which receive the rivets by which the links of the chains 78 are joined together in series.

When the apparatus is in operation, the coal is delivered by the spout 25 upon the deck 21 and piles up about the lower end of the leg 28, and this coal is caught by the scraper blades 87 of the frames 86, and while confined between the end members 88 of said frames is dragged upwardly by the blades 87 along and upon the partition or flooring 77 and finally becomes discharged through the openings 79 in said partition or flooring or at the end of the frame-section 33, as may be desired. The coal dragged upwardly upon the partition or flooring 77 by means of the frames 86 is confined against lateral escape by the end members 88 of said frames and by the cheek plates 85 between which said frames travel. The end members 88 of the frames 86 are always, when in operation, in close relation to said cheek plates 85, which are provided in both the leg and main sections of the conveyer apparatus.

The modification illustrated in Fig. 14 resides merely in the mounting of the conveyer apparatus rather than in any change in the details of construction thereof. The conveyer apparatus shown in Fig. 14 is the same as that illustrated in Fig. 1, and hence the details of the apparatus need not be again referred to specifically. In Fig. 14 the main frame of the apparatus is adjustably suspended by a cable 90 from a boom or the like 91, and the leg 28 of the apparatus projects downwardly at the outer side of the vessel 92 into a hopper 93 which will receive the coal, instead of said coal being delivered within the vessel by means of a spout 25, as shown in Fig. 1. The horizontal outer portion of the main frame of the conveyer extends through an opening in the side of the ship. The adjustable discharge spout 62, shown in Fig. 14, may also be applied to the apparatus shown in Fig. 1 whenever occasion may require, in accordance with the condition of the bunkers of the vessel and the location at which it may be desired to discharge the coal.

The connection of the frame section 32 to the leg section 28 by means of the plates 51, 52, indicated in Figs. 9 and 10, is entirely illustrative of the connection of the main frame sections 32, 33 together at their adjoining ends, and hence it seems that further detailed drawings and explanations as to the connection of the adjoining ends of the frame sections 32, 33 may not be desired. I preferably form the main frame section 27 in sectional parts for convenience in storing, handling, manipulation, installation and for other purposes, and in this in-

stance I have only illustrated the two frame sections 32, 33. It is to be understood, however, that I may interpose another main frame section between the sections 32, 33, employing the same means for doing so that I have indicated with respect to Figs. 3, 4, 9 and 10. If the main frame of the conveyer is elongated by the interposition of another frame section between the frame-sections 32, 33, so as to extend the length of the conveyer apparatus, it will of course be necessary to interpose in the conveyer chains 78 additional links and additional frames 86 to meet the new situation. There would, however, be no essential difference between the construction thus arranged and that illustrated in Fig. 1 with the exception of interposing like parts to elongate the conveyer mechanism.

What I claim as my invention and desire to secure by Letters Patent, is:

1. Apparatus for coaling ships and trimming the bunkers thereof comprising, in combination with such ship, movable conveyer apparatus therefor of the character described and means on the ship for supporting said apparatus and permitting of the positioning thereof with regard to the trimming of the bunkers, said apparatus comprising a main horizontal frame extending inwardly from the side of the ship into the interior thereof, a depending elevator-leg frame pivotally connected with the outer end of said horizontal frame and hanging over the side of the ship, means for locking said leg in fixed adjustment and relation to said main frame, a continuous flooring subdividing said main frame into upper and lower sections and said leg frame into outer and inner sections in continuation of said upper and lower sections, pairs of sprocket-wheels mounted in said frames, a pair of sprocket chains mounted on said wheels extending continuously through both of said frames, means for driving said chains, cheek-pieces closing the sides of said upper main-frame section and the sides of said outer leg-frame section, and scrapers secured to said chains and having transverse members adapted to engage the coal at the lower end of said leg frame and move it upwardly on said flooring through said leg frame and thence along said horizontal frame to the point of discharge.

2. Apparatus for coaling ships and trimming the bunkers thereof comprising, in combination with such ship, movable conveyer apparatus therefor of the character described and means on the ship for supporting said apparatus and permitting of the positioning thereof with regard to the trimming of the bunkers, said apparatus comprising a main horizontal frame extending inwardly from the side of the ship into the interior thereof, a depending elevator-leg frame pivotally connected with the outer end of said horizontal frame and hanging over the side of the ship, means for locking said leg in fixed adjustment and relation to said main frame, a continuous flooring subdividing said main frame into upper and lower sections and said leg frame into outer and inner sections in continuation of said upper and lower sections, pairs of sprocket wheels mounted in said frames, a pair of sprocket chains mounted on said wheels extending continuously through both of said frames, means for driving said chains, cheek pieces closing the sides of said upper main-frame sections and the sides of said outer leg-frame section, and scrapers secured to said chains and having transverse members adapted to engage the coal at the lower end of said leg frame and move it upwardly on said flooring through said leg frame and thence along said horizontal frame to the point of discharge, said flooring in the main frame having discharge openings and gates for controlling the discharge of the coal therethrough.

3. Apparatus for coaling ships and trimming the bunkers thereof comprising, in combination with such ship, movable conveyer apparatus therefor of the character described and means on the ship for supporting said apparatus and permitting of the positioning thereof with regard to the trimming of the bunkers, said apparatus comprising a main horizontal frame extending inwardly from the side of the ship into the interior thereof, a depending elevator-leg frame pivotally connected with the outer end of said horizontal frame and hanging over the side of the ship, means for locking said leg in fixed adjustment and relation to said main frame, a continuous flooring subdividing said main frame into upper and lower sections and said leg frame into outer and inner sections in continuation of said upper and lower sections, pairs of sprocket wheels mounted in said frames, a pair of sprocket chains mounted on said wheels extending continuously through both of said frames, means for driving said chains, cheek pieces closing the sides of said upper main-frame section and the sides of said outer leg-frame section, and scrapers secured to said chains and having transverse members adapted to engage the coal at the lower end of said leg frame and move it upwardly on said flooring through said leg frame and thence along said horizontal frame to the point of discharge, said flooring in the main frame having discharge openings and gates for controlling the discharge of the coal therethrough, and said gates being in pairs pivotally secured to said flooring and adapted to be opened outwardly in a lateral direc-

tion from each other to a greater or less extent as occasion may require.

4. Apparatus for coaling ships and trimming the bunkers thereof comprising, in combination with such ship, movable conveyer apparatus therefor of the character described and means on the ship for supporting said apparatus and permitting of the positioning thereof with regard to the trimming of the bunkers, said apparatus comprising a main horizontal frame extending inwardly from the side of the ship into the interior thereof, a depending elevator-leg frame pivotally connected with the outer end of said horizontal frame and hanging over the side of the ship, means for locking said leg in fixed adjustment and relation to said main frame, a continuous flooring subdividing said main frame into upper and lower sections and said leg frame into outer and inner sections in continuation of said upper and lower sections, pairs of sprocket wheels mounted in said frames, a pair of sprocket chains mounted on said wheels extending continuously through both of said frames, means for driving said chains, cheek pieces closing the sides of said upper main-frame section and the sides of said outer leg-frame section, and scrapers secured to said chains and having transverse members adapted to engage the coal at the lower end of said leg frame and move it upwardly on said flooring through said leg frame and thence along said horizontal frame to the point of discharge, said flooring in the main frame having a plurality of discharge openings and longitudinally disposed pivoted gates in pairs therefor, and said gates of each pair being independently movable in a lateral direction from or toward each other.

5. Apparatus for coaling ships and trimming the bunkers thereof comprising, in combination with such ship, movable conveyer apparatus therefor of the character described and means on the ship for supporting said apparatus and permitting of the positioning thereof with regard to the trimming of the bunkers, said apparatus comprising a main horizontal frame extending inwardly from the side of the ship into the interior thereof, a depending elevator-leg frame pivotally connected with the outer end of said horizontal frame and hanging over the side of the ship, means for locking said leg in fixed adjustment and relation to said main frame, a continuous flooring subdividing said main frame into upper and lower sections and said leg-frame into outer and inner sections in continuation of said upper and lower sections, pairs of sprocket wheels mounted in said frames, a pair of sprocket chains mounted on said wheels extending continuously through both of said frames, a driving motor mounted on the inner end of said main frame and connected by gearing to the shaft of the adjacent pair of sprocket wheels for driving said chains, cheek pieces closing the sides of said upper main-frame section and the sides of said outer leg-frame section, and scrapers secured to said chains and having transverse members adapted to engage the coal at the lower end of said leg frame and move it upwardly on said flooring through said leg-frame and thence along said horizontal frame to the point of discharge.

Signed at New York city, in the county of New York and State of New York, this 15th day of July, A. D. 1919.

LOUIS LOMBI.

Witnesses:
ARTHUR MARION,
CHAS. C. GILL.