Oct. 23, 1962 L. F. HOLLEEN 3,059,258

ADJUSTABLE DOCK RAMP

Filed Oct. 7, 1959

3 Sheets-Sheet 1

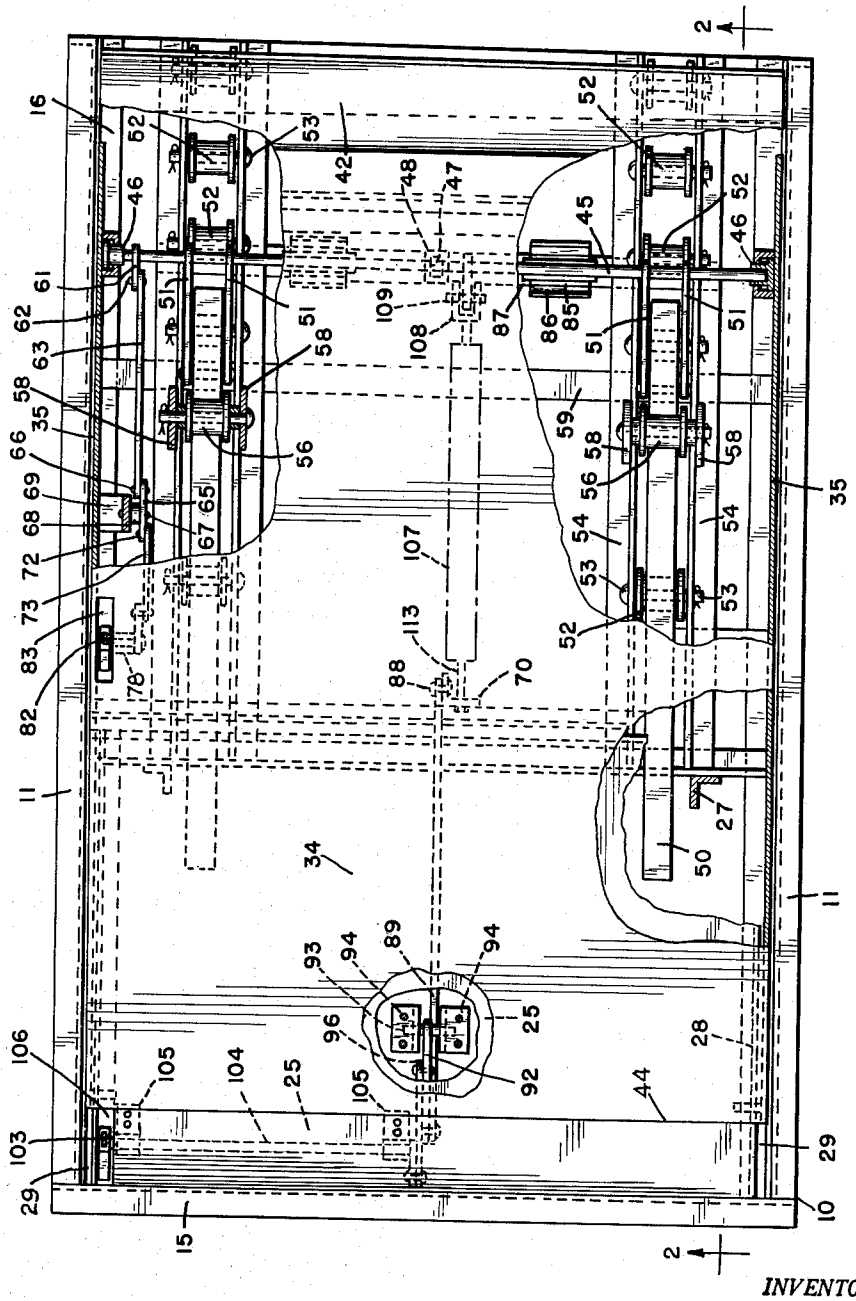


FIG. 1

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3 Sheets-Sheet 2

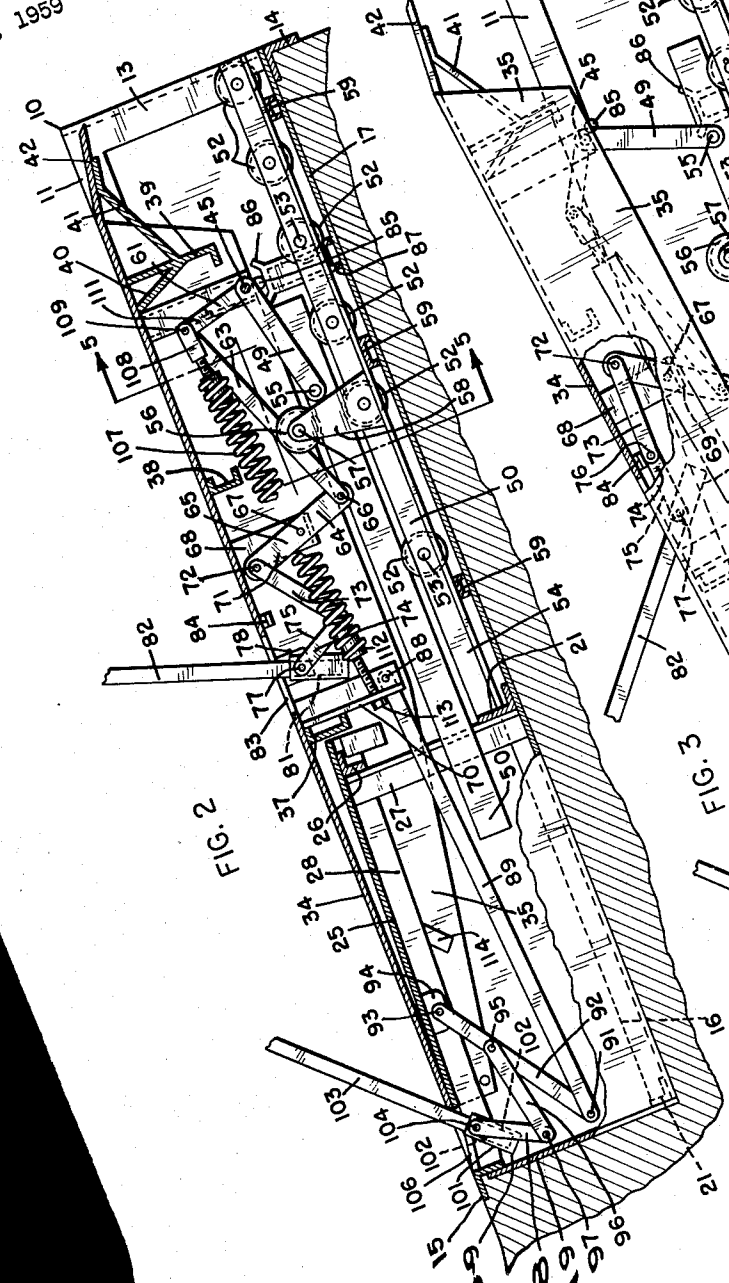


FIG. 2

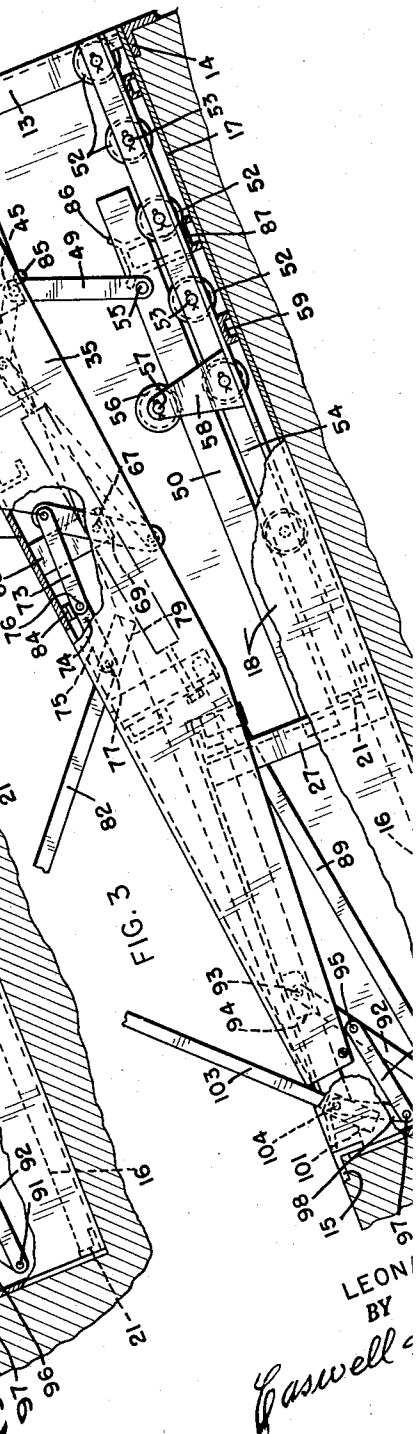


FIG. 3

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FIG. 4

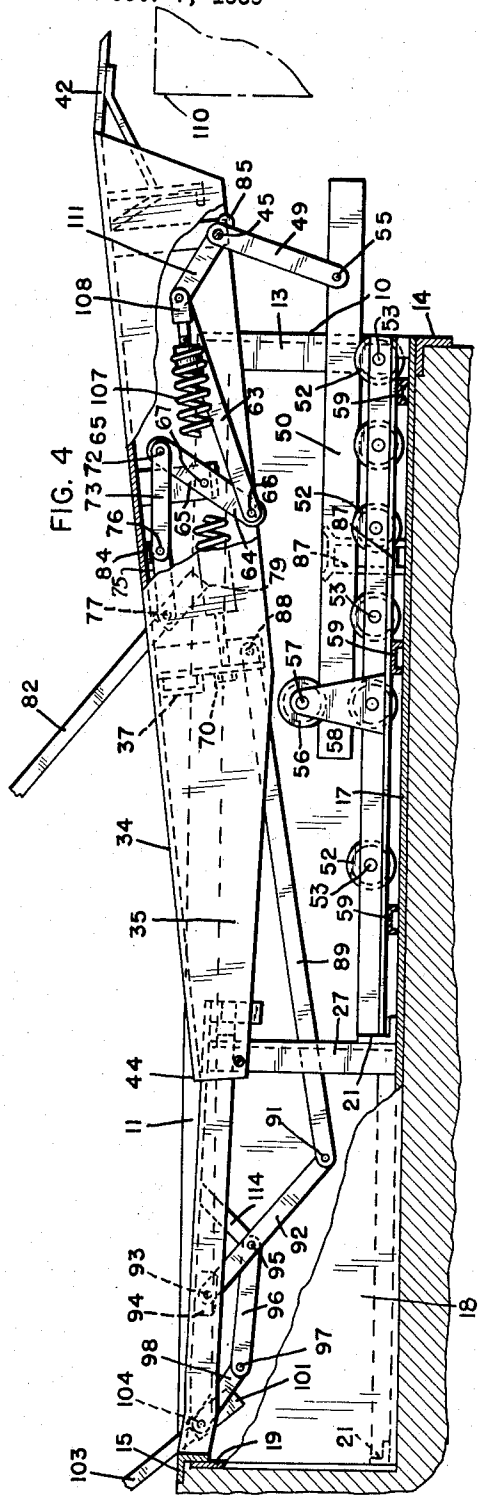
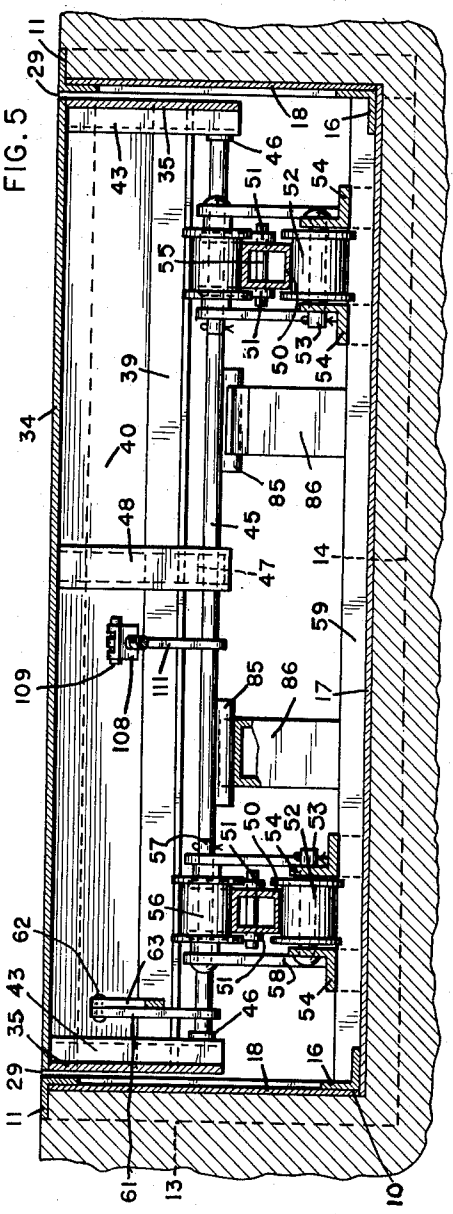


FIG. 5



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ADJUSTABLE DOCK RAMP

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Filed Oct. 7, 1959, Ser. No. 844,981
7 Claims. (Cl. 14—71)

The herein described invention relates to adjustable dock ramps and particularly to a dock ramp such as disclosed in my copending application for patent on adjustable dock ramps, Serial Number 625,952, filed December 3, 1956 and issued into Patent No. 2,908,024 on October 13, 1959. In the construction shown in said application the projection of the deck outwardly of the dock was sufficient to service trucks and similar motor vehicles and was limited to such service.

An object of the instant invention is to provide a construction whereby the projection of the deck beyond the dock in which it is installed would be sufficient to service box cars and other railway equipment disposed on tracks adjacent the dock.

Another object of the invention resides in providing a structure extensible beyond the deck of the ramp and carried thereby and movable relative to both the deck and the dock and with which the raising mechanism of the invention cooperates.

A still further object of the invention resides in providing a floating rail for the purpose of supporting the deck and with which the raising mechanism of the invention cooperates.

Another object of the invention resides in utilizing one or more floating rails and to which the deck raising arms are pivoted, this rail or rails being supported on wheels pivotally mounted on pintles having fixed axes relative to the frame of the invention.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

FIG. 1 is a plan view of an adjustable dock ramp with parts broken away and illustrating an embodiment of the invention.

FIG. 2 is a longitudinal sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a side elevational view similar to FIG. 2 with parts broken away and showing the forward end of the dock elevated.

FIG. 4 is a view similar to FIG. 3 showing the dock elevated and advanced outwardly of the dock.

FIG. 5 is a cross sectional view taken on line 5—5 of FIG. 2 and drawn to a greater scale.

This application is a continuation in part of my copending application for patent, Serial Number 625,952, filed December 3, 1956.

The construction shown in the drawings comprises a frame 10 which consists of two longitudinal frame members 11. These frame members are supported on posts 13 which rest on an outer frame member 14 located at the outer end of the frame 10. The frame members 11 are connected to an inner cross frame member 15. Attached to the outer cross frame member 14 and underlying the frame members 11 are longitudinal frame members 16. Extending across the frame members 11 and 16 are two plates 18 which extend throughout the length thereof. At the rear of the frame 10 is provided another cross frame member 21 and between this cross frame member and the frame member 15 is an inner plate 19. the longitudinal frame members 16 and the cross frame member 21 have attached to the underside thereof a plate 17 which extends completely across the bottom of the frame 10 and which rests upon and is secured to the cross frame member 14. All of these parts are securely

welded together or may be secured together in any other suitable manner.

At the inner portion of the ramp is provided a tail plate 25 which extends transversely of the frame 10 and which generally inclines downwardly as shown in FIG. 2. This tail plate is secured at its rearward end to the cross frame member 15 by welding or otherwise and has attached to the forward underside thereof a transverse frame member 26. In addition the tail plate 25 is provided with depending flanges 28 which are spaced from the frame members 11 to form slots 29 therebetween. The forward portion of the tail plate 25 is supported on legs 27 which are attached to the cross frame member 26 and the flanges 28 and which rest upon the bottom plate 17 of frame 10. The said legs are further attached to a transverse frame member 21 which rests upon and is secured to the bottom plate 17 as well as to the longitudinal frame members 16.

The ramp further comprises a deck 34 constructed of sheet iron and which has welded to the longitudinal edges thereof two deep flanges 35. These flanges have secured to them transverse frame members 37 and 38 which underlie the deck and which stiffen and reinforce the same. The forward portion of the deck 34 is formed with an apron 42 which inclines with respect to said deck as shown in FIG. 2. This apron is reinforced by means of a depending plate 39 welded to the flanges 35 and to the deck proper. The said plate is reinforced by means of braces 40 and 41 which are welded to said plate and to the deck and apron. The innermost edge 44 of the deck 34 is supported upon the tail plate 25 and slides in a longitudinal direction along the same, the flanges 35 being received in the slots 29.

The outermost portion of the deck 34 is supported by means of the following construction: Extending across the two flanges 35 is a shaft 45 which is journaled in bearings 46 attached to uprights 43 which in turn are welded to said flanges. The shaft is further journaled in an intermediate bearing 47 formed at the end of a box type of hanger 48 secured to the underside of the deck 34 in close proximity to the transverse frame member or plate 39. Secured to the shaft 45 in proximity to the bearings 46 are two depending arms 49 each of which consist of two spaced plates 51 shown in detail in FIGS. 1 and 5. Disposed between these plates is a floating rail 50, box-like in form, and which rests upon a number of flanged wheels 52. These flanged wheels are mounted on pintles 53 which pass through the upwardly extending flanges of spaced angle frame members 54. The angle frame members 54 rest on inverted channel frame members 59 which are welded to the bottom plate 17 and to the longitudinal frame member 16. The lower ends of the plates 51 of arms 49 straddle the rails 50 and are pivotally connected thereto by means of pintles 55 which extend through said arms and rails. To maintain the rails 50 in position upon the wheels 52, another wheel 56 is employed, which is pivoted on a pintle 57 extending through two spaced uprights 58 welded to the angle frame members 54. The shaft 45, arms 49 and pintle 55 form connecting means between the deck and rail for causing longitudinal movement of the rail upon longitudinal movement of the deck.

Attached to the shaft 45 at a locality adjacent one of the bearings 46 is an arm 61 which extends at an angle with respect to the arms 49. This arm and the arms 49 are welded or otherwise rigidly secured to shaft 45. The arm 61 has pivoted to the end of it by means of a pintle 62 a link 63 which in turn is pivoted to an arm 64 of a reversing lever 65 by means of a pintle 66. Lever 65 is pivoted by means of a pintle 67 to a hanger 68 which is secured to the underside of deck 34. A brace 69 is secured to the lower end of the hanger 68 and also

to the adjoining flange 35 of the deck 34 which reinforces said hanger. Lever 65 has another arm 71 which has pivoted to it by means of a pintle 72 a link 73 which in turn is pivoted to an arm 74 of another lever 75 by means of a pintle 76. Lever 75 is pivoted by means of a pintle 77 to a bearing 78 attached to the underside of the deck 34. The lever 75 has another arm 79 which is formed with a socket 81 and in which a handle 82 may be removably disposed. The handle 82 extends through a slot 83 in the deck 34 in one of the lateral edges thereof. By shifting the handle 82 in a back and forth direction levers 75 and 65 may be swung about the pintles 77 and 67 to swing the arms 49 and to elevate or depress the deck 34 to the positions shown in FIG. 3 and FIG. 2. It will be noted in FIG. 3 that when the deck is raised that the arm 74 and link 73 are positioned slightly beyond alignment. A stop 84 secured to deck 34 engages said link and terminates movement of the parts beyond alignment. In said position of lever 75 the deck is locked in its elevated position.

The deck 34 when in its normal position is held in coplanar relationship with reference to the upper surfaces of the longitudinal frame members 11 to permit of cross traffic by means of the following construction: On the shaft 45 are welded shoes 85 which are adapted to rest on two rests 86 secured to a cross frame member 87. This frame member is welded to the longitudinal frame member 16 and to the bottom plate 17 as shown in FIG. 5.

Deck 34 can be moved longitudinally while in its normal position or its vertically adjusted position. For this purpose, a bracket 70 is secured to said deck on the underside thereof and to the cross frame member 37 thereof by welding. This bracket extends downwardly below said deck and has pivoted to the lower end thereof by means of a pintle 88 a link 89. Link 89 is in turn pivoted by means of a pintle 91 to a lever 92. Lever 92 is pivoted by means of a pintle 93 to brackets 94 secured to the underside of the tail plate 25. The lever 92 has pivoted to it intermediate its ends by means of a pintle 95 a link 96 which in turn is pivoted by means of a pintle 97 to an arm 98 of a lever 99. Lever 99 includes an arm 101 which is formed with a socket 102 in which is removably disposed a handle 103. Lever 99 is pivoted by means of a shaft 104 which is journaled in bearings 105 attached to the underside of the tail plate 25. Handle 103 is movable in a slot 106 in said tail plate for the purpose.

In order to counterbalance the weight of the deck 34 and attached parts, a tension coil spring 107 is employed, which has attached to one end of it a spring anchor 108 pivoted by means of a pintle 109 to an arm 111. This arm is secured to the shaft 45. The other end of this spring has secured to it a spring anchor 112 which is tapped to receive a bolt 113. This bolt extends through the bracket 70 and upon rotation thereof serves to vary the tension on the spring and to adjust the counterbalancing effect thereof.

Link 96 and lever 92 are prevented from reaching alignment by means of a stop 114 which is secured to the tail plate 25. This stop, when the deck 34 is outermost, engages lever 92 as shown in FIG. 4 and terminates outward movement of the deck.

The dock ramp of the invention is installed in the dock with the upper surface of the frame 10 formed by the frame members 11 and 15 at the elevation of the floor of the dock. Concrete is then poured around the structure and the floor finished to the level of the ramp. Where the ramp is being installed in an existing dock, sufficient material is cut away to make a cavity large enough to receive the assembled ramp structure. The same is then installed in the cavity thus formed and finished by placing concrete about the same.

The method of using the invention is obvious. With the deck in the position shown in FIG. 2 the truck to be loaded is backed up to the dock. Assume that the position of the rear end of the truck is that indicated by the reference numeral 110. The deck is then raised to the maximum vertical height by pulling lever 82 rearwardly until the arm 74 and link 73 pass alignment, as shown in FIG. 3, which automatically locks the deck in raised position. Raising the deck is accomplished by the swinging of the arms 49 through the linkage connected thereto and to handle 82. This frees the feet 85 from the rests 86. This also moves rail 50 in an outward direction a certain amount. The deck may now be moved outwardly a distance necessary to overlie the floor of the truck by pulling the handle 103 rearwardly and which, through the linkage connected therewith, causes the floating rail 50 to further roll on the wheels 52 and the rear edge 44 of the deck 34 to slide along the upper surface of the tail plate 25. When the apron 42 is well over the rearward portion 110 of the floor of the truck, as shown in FIG. 4, handle 82 is moved forwardly to bring the apron into engagement with the same. The dock ramp is now ready for use and the deck 34 will float up and down in accordance with up and down movement of the truck floor. In bringing the deck back to normal position the deck is raised again to full vertical height as previously described. Handle 103 is then moved forwardly which moves the deck in a rearward direction and brings the feet 85 above the rests 86 when the deck is in its fully retracted position. The deck can now be lowered through handle 82 and when the feet 85 come to rest on the rests 86 the deck is back in normal position. In such position the deck is level with the surface of the dock and traffic may cross the same if desired.

The advantages of the invention are manifest. The adjustable dock ramp has all of the advantages of the construction disclosed in my copending application for patent above referred to. In addition the floating rail permits of moving the deck with the apron extending considerably beyond the frame of the ramp. By means of this construction it is possible to use the ramp for loading box cars mounted on tracks lying adjacent the dock thus extending the usefulness of the device from trucks to railway equipment as well.

Changes in the specific form of the invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of the invention.

Having described the invention, what is claimed as new and desired to be protected by Letters Patent is:

1. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge disposed adjacent and slidable along said tail plate and in a longitudinal direction relative to said frame, a longitudinally extending floating rail disposed below said deck, guide means acting between said rail and frame and guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, supporting and raising means for elevating or lowering the outer end of said deck comprising an arm pivotally connected to the rail and to the deck at a locality between the rearward and forward portions thereof movable in an up and down direction, linkage means for swinging said arm to raise or lower said deck, and means acting between said deck and frame and moving said deck and rail in a back and forth direction.

2. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge disposed adjacent and slidable along said tail plate and in a longitudinal direction relative to said frame, a longitudinally extending floating rail disposed below said deck, revoluble guide means acting between said rail and said frame and guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, supporting and raising means for elevating or lowering the outer end of said deck com-

prising an arm pivotally connected to the rail and to the deck at a locality between the rearward and forward portions thereof movable in an up and down direction, linkage means for swinging said arm to raise or lower said deck, and means acting between said deck and frame and moving said deck in a back and forth direction.

3. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge disposed adjacent and slidable along said tail plate and in a longitudinal direction relative to said frame, a longitudinally extending floating rail disposed below said deck, elongated supporting means disposed below said rail and parallel thereto, wheels mounted for rotation and acting between said rails and supporting means and guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, supporting and raising means for elevating or lowering the outer end of said deck comprising an arm pivotally connected to the rail and to the deck at a locality between the rearward and forward portions thereof movable in an up and down direction, linkage means for swinging said arm to raise or lower said deck, and means acting between said deck and frame and moving said deck in a back and forth direction.

4. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge disposed adjacent and slidable along said tail plate and in a longitudinal direction relative to said frame, two longitudinally extending elongated members disposed one above the other and beneath said deck, one of said members being a rail and the other a support, wheels pivotally mounted on said support in longitudinally spaced relation to one another and engaging said rail and guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, supporting and raising means for elevating or lowering the outer end of said deck comprising an arm pivotally connected to the rail and to the deck at a locality between the rearward and forward portions thereof movable in an up and down direction, linkage means for swinging said arm to raise or lower the uppermost of said members, and means acting between said deck and frame and moving said deck in a back and forth direction.

5. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge disposed adjacent and slidable along said tail plate and in a longitudinal direction relative to said frame, a longitudinally extending floating rail disposed below said deck, an elongated supporting member disposed below said rail in parallel relation with respect thereto and fixed relative to the frame, wheels carried by said supporting member and disposed in longitudinally spaced

relation relative to one another, said wheels engaging said rail for guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, supporting and raising means for elevating or lowering the outer end of said deck comprising an arm pivotally connected to the rail and to the deck at a locality between the rearward and forward portions thereof movable in an up and down direction, linkage means for swinging said arm to raise and lower the deck, and means acting between said deck and frame and moving said deck in a back and forth direction.

6. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge superimposing and resting upon and slidable along the upper surface of said tail plate and in a longitudinal direction relative to said frame, a longitudinally extending floating rail disposed below said deck having upper and lower wheel engaging surfaces, an elongated supporting member disposed below said rail in parallel relation with respect thereto and fixed relative to the frame, wheels carried by said supporting member and disposed in longitudinally spaced relation relative to one another, said wheels engaging the lower surface of said rail, a wheel disposed inwardly of the outermost of said first named wheels and having its axis fixed relative to said frame said last named wheel being disposed above said rail and engaging the upper surface thereof, said wheels guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, supporting and raising means for elevating or lowering the outer end of said deck comprising a linkage having a part movable in an up and down direction, said part being pivotally connected between the rail and deck, and means acting between said deck and frame and moving said deck and rail in a longitudinal direction.

7. In an adjustable dock ramp an elongated frame, a tail plate carried by said frame at the upper portion of the inner end thereof, a deck having its innermost edge disposed adjacent and slidable along said tail plate and in a longitudinal direction relative to said frame, a longitudinally extending floating rail disposed below said deck, guide means acting between said rail and frame and guiding said rail for longitudinal movement relative to said frame from a position within said frame and to an extended position, means movably acting between said deck and rail for raising and lowering the deck and for causing longitudinal movement of said rail upon longitudinal movement of said deck, and means acting between said deck and frame and moving said deck in a longitudinal direction.

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