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K. W. BACON ET AL

3,404,635

BOAT AMUSEMENT RIDE

Filed April 16, 1965

4 Sheets-Sheet 1

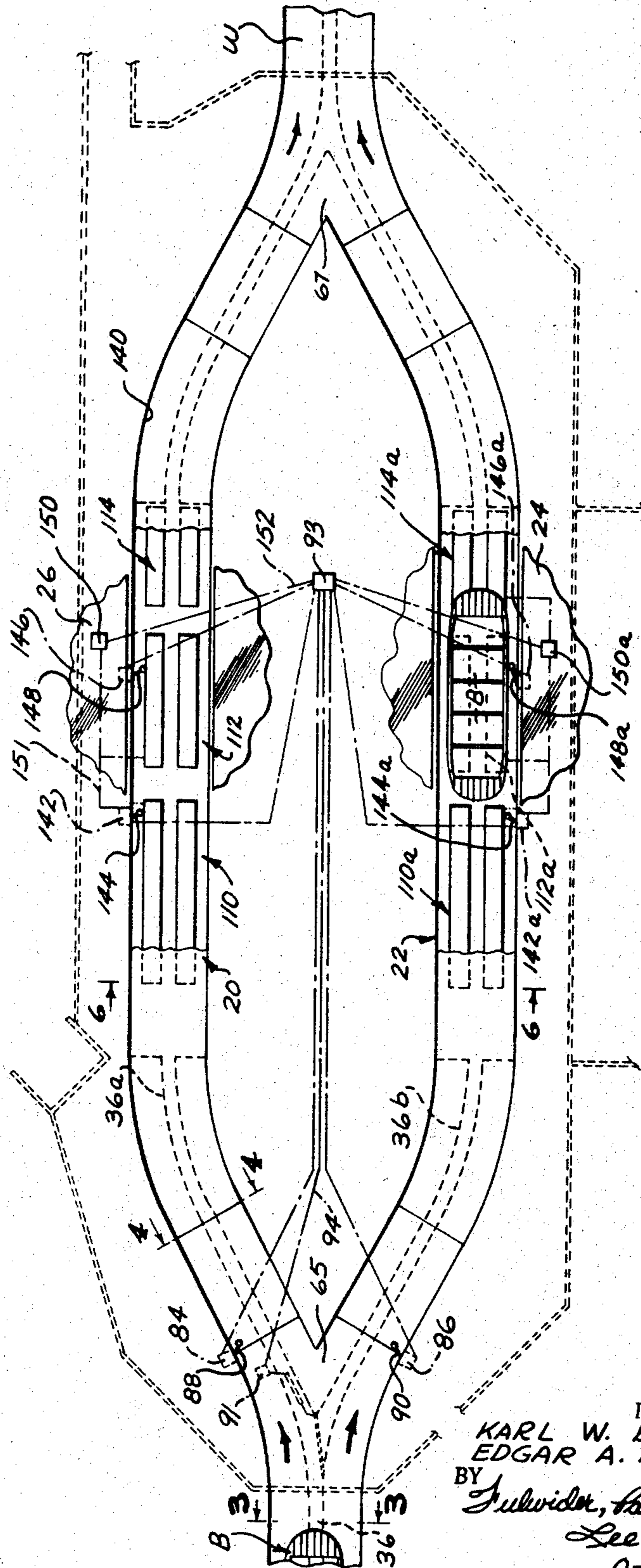


FIG. 1

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4 Sheets-Sheet 2

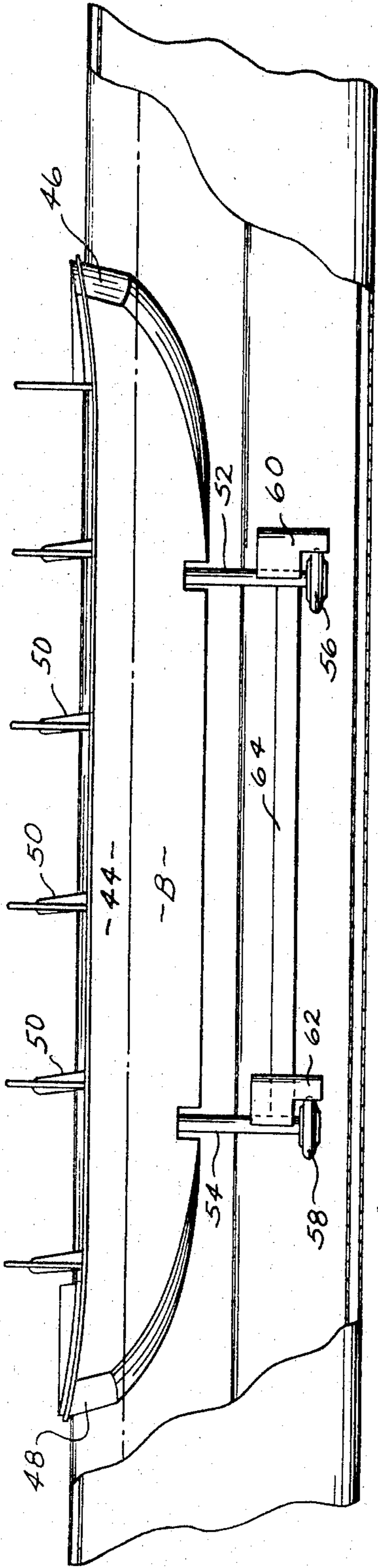


FIG. 1

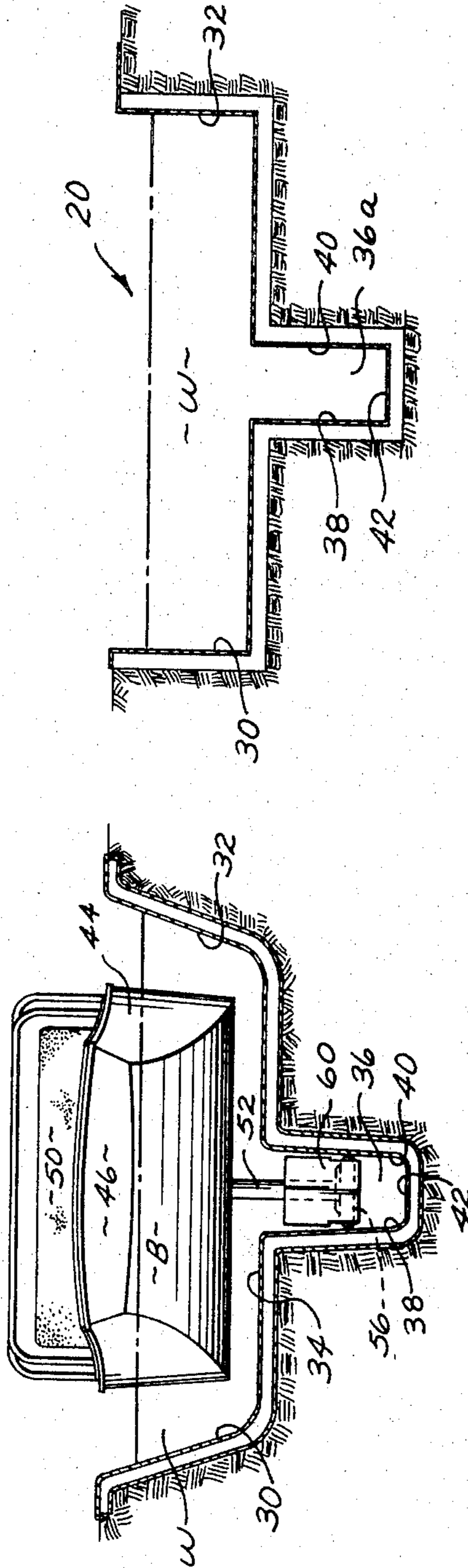


FIG. 2

FIG. 3

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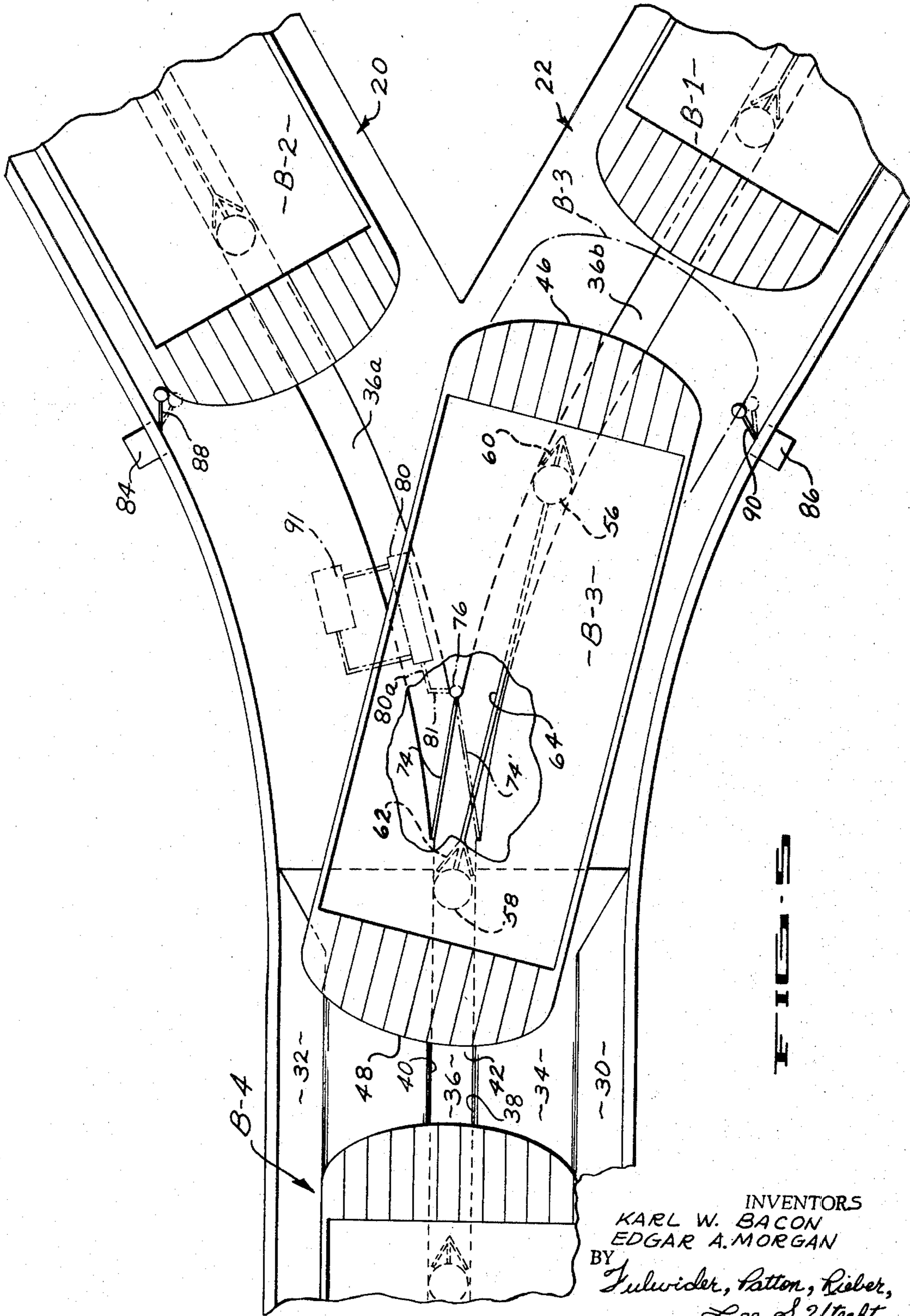
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4 Sheets-Sheet 3



F I L E S

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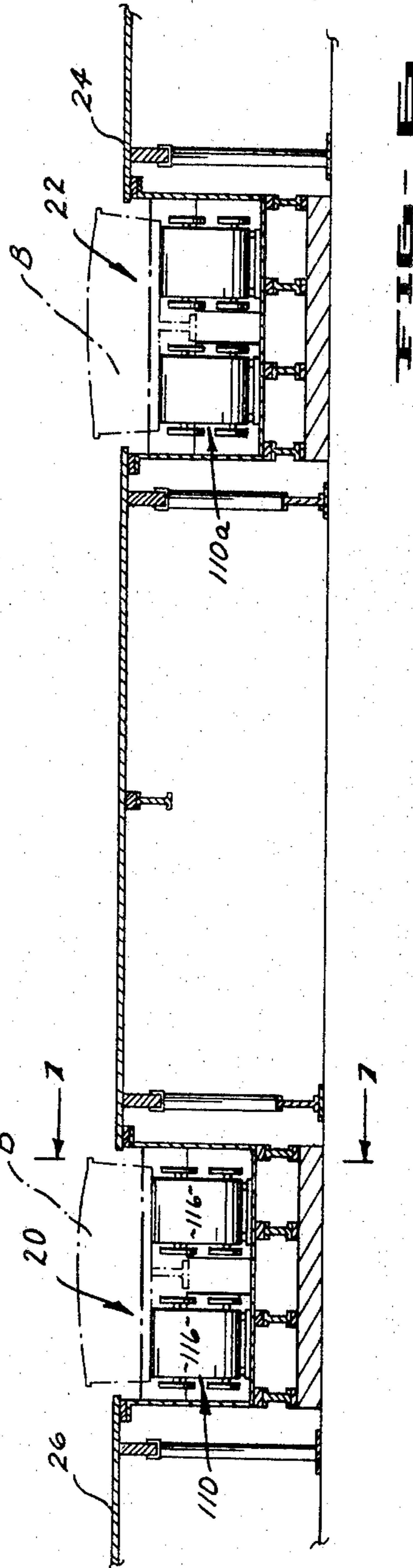
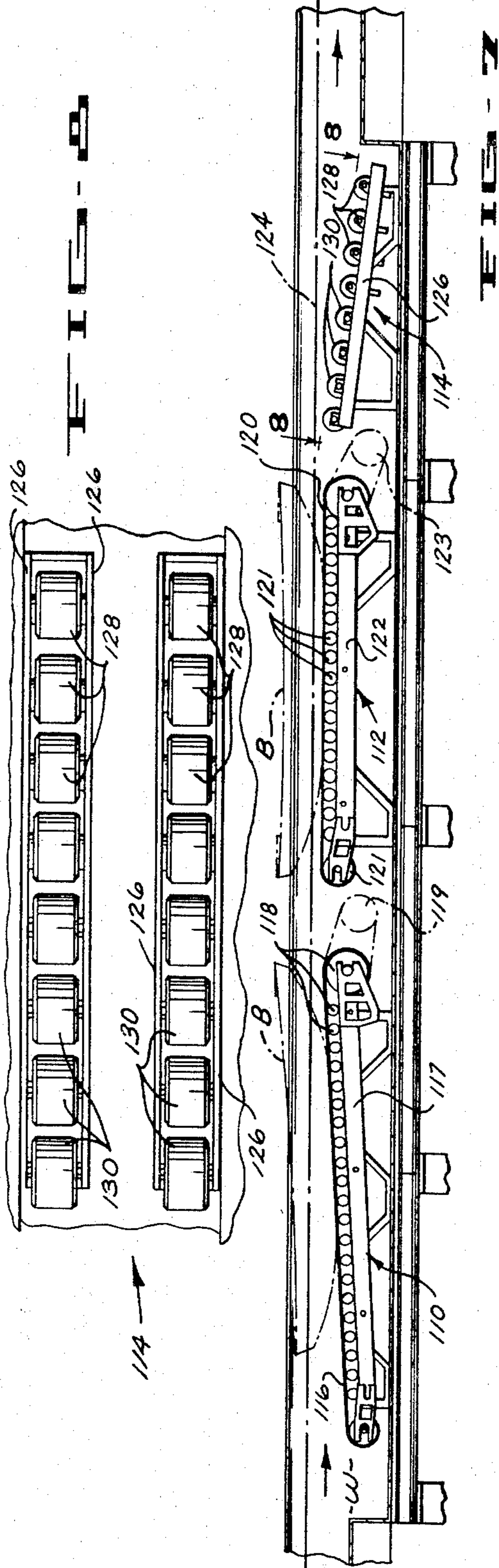
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BOAT AMUSEMENT RIDE

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4 Sheets-Sheet 4



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3,404,635

**BOAT AMUSEMENT RIDE**

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12 Claims. (Cl. 104—70)

**ABSTRACT OF THE DISCLOSURE**

A passenger-carrying boat amusement ride having a continuous waterway with a section that is bifurcated to define first and second branches, each of the branches being provided with a passenger loading station. A plurality of boats are moved along such waterway and are selectively switched into either the first or the second branch so that boats may be alternately loaded from either the first or the second loading station thereby permitting a maximum number of passengers to be loaded and unloaded in a minimum time. The apparatus of the present invention also includes at both loading stations an upwardly inclined lift conveyor which raises the boats onto a discharge conveyor, with the latter supporting the boats in a non-buoyant condition that eliminates any tipping of the boats during passenger loading and unloading thereby expediting such operation. After the boats are loaded they return to the waterway by means of a downwardly inclined ramp.

The present invention relates generally to amusement apparatus and more particularly to a passenger-carrying boat amusement ride.

There have been heretofore proposed boat amusement rides utilizing a continuous waterway along which a plurality of passenger-carrying buoyant boats travel in a fixed and predetermined course. Passengers generally board and leave the boats at a loading station, the boats being stopped at such loading station for this purpose. The loading-unloading operation requires considerable time thereby reducing the number of passengers that can be handled. Many passengers will forego the pleasure of a ride rather than wait in line to board the boats.

It is a major object of the present invention to provide a boat amusement ride of the aforescribed nature which is capable of handling a maximum number of passengers per increment of time.

Another object of the present invention is to provide a boat amusement ride utilizing a continuous waterway having a loading station at which passengers are loaded and unloaded from boats, with such ride including a lift conveyor which raises the boats onto a discharge conveyor, the discharge conveyor supporting the boats in a non-buoyant condition that eliminates any tipping of the boat during passenger loading and unloading, and such ride further including a down ramp that receives loaded boats from the dispatch conveyor and transfers such boats back into the waterway for buoyant travel therealong.

An additional object of the present invention is to provide a boat amusement ride of the immediately aforescribed nature having novel control means for operating the lift and dispatch conveyors whereby proper spacing between the boats may be maintained.

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Yet a further object of the present invention is to provide a boat amusement ride that includes a continuous waterway having a section that is bifurcated to define first and second branches, with each of said branches being provided with a passenger loading station and having unique means for selectively switching the boats into either the first branch or the second branch.

These and other objects and advantages of the present invention will become apparent from the following detailed description, when taken in conjunction with the appended drawings wherein:

FIGURE 1 is a top plan view of a preferred form of boat amusement ride embodying the present invention and particularly showing the boat loading-unloading area of such ride;

FIGURE 2 is a side elevational view of a waterway utilized in said boat amusement ride apparatus, with such waterway being broken away to show a boat floating therein;

FIGURE 3 is a vertical sectional view taken in enlarged scale along line 3—3 of FIGURE 1;

FIGURE 4 is a vertical sectional view taken in enlarged scale along line 4—4 of FIGURE 1;

FIGURE 5 is a fragmentary top plan view showing a boat switching arrangement utilized with said ride;

FIGURE 6 is a vertical sectional view taken in enlarged scale along line 6—6 of FIGURE 1;

FIGURE 7 is a vertical sectional view taken on line 7—7 of FIGURE 6; and

FIGURE 8 is a top plan view of a down ramp utilized in said ride.

Referring to the drawings, a preferred form of boat amusement ride apparatus embodying the present invention includes a continuous waterway W, only a portion of which is shown in the drawings. The waterway W follows a generally circuitous course and a plurality of boats B are adapted to be moved along the waterway in a fixed and predetermined path. It is contemplated that entertainment means be arranged along the length of the waterway for the pleasure of passengers occupying the boats B.

With particular reference to FIGURE 1, the waterway W has a loading-unloading area section that is bifurcated to define first and second like branches, generally designated 20 and 22. Each branch 20 and 22 directs the boats B past loading station platform 24 and 26, respectively, at which passengers are loaded and unloaded with respect to the boats B. The platforms 24 and 26 may be arranged on both sides of branches 20 and 22. In FIGURE 1 a boat B is arranged at passenger unloading station platform 26. Means to be described fully hereinafter are provided for selectively switching the boats B into the first and second branches 20 and 22 for loading and unloading of passengers.

More particularly, and with special reference to FIGURES 2 and 3, the waterway W includes an upper portion defined by a pair of side walls 30 and 32 and a bottom wall 34. The width between the side walls 30 and 32 will be somewhat greater than the width of the boats B. The lower portion of the waterway W is provided with a rectangular guide trough 36 defined by side walls 38 and 40 and a bottom wall 42.

With continued reference to FIGURES 2 and 3, each boat B includes a hull 44 having a bow section 46 and



a stern section 48. The hull 44 is provided with a plurality of passenger-receiving seats 50 of conventional construction. The hull 44 is provided along its longitudinal center line with the vertical front and rear struts 52 and 54, respectively, that rigidly depend from the boat into the confines of the guide trough 36. The lower end of the struts 52 and 54 rotably support front guide wheel 56 and rear guide wheel 58, respectively, such guide wheels rotating about a vertical axis of rotation. A front splitter element 60 is rigidly affixed to the front strut 52 forwardly of the front guide wheel 56. A like splitter element 62 is rigidly affixed to the front of the rear strut 54 forwardly of the rear guide wheel 58. One or more elongated elements such as cables 64 are stretched between the front and rear struts 52 and 54. The clearance between the front and rear guide wheels 56 and 58 and the side walls 38 and 40 of the guide trough 36 is so selected that these guide wheels will remain within the guide trough 36 so as to guide the boats B along the center of the waterway W.

It is contemplated that forward motion of the boats B along the waterway will be accomplished by effecting continuous forward movement of the water contained within the waterway. Continuous forward movement of the water may be obtained by means of conventional pumps (not shown) having their discharges directed downstream relative to the waterway. Such an arrangement is well known to those skilled in the art and the details thereof are not important to an understanding of the present invention. It should be noted, however, that where the cross-sectional area of the waterway W is increased at the bifurcated area thereof shown in FIGURE 1, it is desirable to reduce the depth of the waterway so as to maintain a more nearly constant water velocity. Thus, the bottom walls 34 and 42 of the waterway W should be elevated and the space between the side walls 30 and 32 should be reduced adjacent the entrance 65 and the exit 67 of the branches 20 and 22. This difference in spacing is shown in FIGURE 4.

Referring now particularly to FIGURE 5, the guide trough 36 merges into first and second auxiliary guide troughs 36a and 36b in the first and second branches 20 and 22. A vertically extending control gate 74 is mounted at the entrance of the auxiliary guide troughs 36a and 36b. The control gate 74 may take the form of a flat plate having one end rigidly affixed to a vertical post 76. The post 76 is rotated so as to alternatively maintain the gate in either its solid outline position of FIGURE 5 or its dotted outline position 74' thereof. With the gate 74 arranged in its solid outline position of FIGURE 5 the guide wheels 56 and 58 of the boat B-1 shown therein will be directed into the auxiliary guide trough 36b. With the gate 74 arranged in its dotted outline position 74' of this figure the boat guide wheels will be directed into the opposite auxiliary guide trough 36a. Actuation of the gate 74 may be effected by means of a conventional air cylinder and piston power unit 80 positioned below the waterway W, the plunger 80a of such unit being pivotally connected to a crank arm 81 that is affixed to post 76.

Operation of the air cylinder and piston power unit 80 is effected by means of first and second electric limit switches 84 and 86 positioned respectively adjacent the entrance portions of the first and second branches 20 and 22, as shown particularly in FIGURES 1 and 5. The limit switches 84 and 86 include wands 88 and 90 having their free ends normally disposed in the path of the boats B. Wiring 91 electrically connects the limit switches 84 and 86 to a solenoid-actuated air valve unit 91 that admits and discharges compressed air relative to the air cylinder and piston power unit 80 in a conventional manner so as to extend and retract the plunger 80a of unit 80. With this arrangement, movement of the wands 88 and 90 from their normal position shown in dotted outline in FIGURE 5 to their displaced position shown in

solid outline therein will cause the cylinder and piston unit 80 to move the gate 73 between its two positions 74 and 74' in a manner to be fully set forth hereinafter. Manual overcontrol of the solenoid 91 and hence of the gate 74 may be provided by means of a suitable control panel 93 having conventional electric switches (not shown) connected to air valve unit 91 by suitable wiring 94.

Referring particularly to FIGURES 1, 6 and 7, the first and second branches 20 and 22 are each provided with identical conveyor means for raising the boats B upwardly relative to the water into a non-buoyant horizontal position adjacent the loading station platforms 24 and 26 and thereafter returning the boats downwardly into a buoyant condition relative to the water. Thus, the first branch 20 is provided with an upwardly inclined power-operated lift conveyor, generally designated 110, a horizontally extending dispatch conveyor, generally designated 112, and a downwardly inclined down ramp, generally designated 114. The second branch 22 is provided with identical conveyor members, generally designated 110a, 112a and 114a. The lift conveyor 110 includes a pair of parallel, transversely aligned endless conveyor belts 116 carried on an upwardly and forwardly inclined rigid frame 117 having its lower end anchored within the waterway W. Conveyor belts 116 are drivingly supported upon a plurality of rollers 118 mounted on frame 117, with one or more of such rollers being rotated as by means of an electric motor 119. The dispatch conveyor 112 includes a pair of parallel, transversely aligned endless belts 120 supported upon rollers 121 carried by a horizontal rigid frame 122 having its lower end anchored within the waterway W adjacent the loading station platform 24. One or more of the rollers 121 are powered as by means of an electric motor 123. The endless belts 120 are elevated sufficiently to support the boats B in a non-buoyant condition. It will be apparent that the space between belts 116 and 120 provide clearance for the struts 52, guide wheels 56 and 58 and splitters 60 and 62 of boats B.

The down ramp 114 includes a downwardly and forwardly inclined rigid frame 126 that rests upon the base of the waterway W. The frame 126 supports a plurality of pairs of vertically casted rollers 128 and a plurality of pairs of fixed rollers 130, the casted rollers 128 being positioned along the lower half of the frame 126 and the fixed rollers 130 being positioned along the upper half thereof. As indicated particularly in FIGURE 8, the space between the pairs of rollers provide clearance for the struts 52, guide wheels 56 and 58 and splitters 60 and 62 of boats B.

From the aforesaid description of the lift conveyor 110 and the dispatch conveyor 112, it will be apparent that the lift conveyor 110 raises the boats B upwardly while moving such boats forwardly until the boats are transferred onto the dispatch conveyor 112 located alongside loading station platform 24. When the passengers in an individual boat B have disembarked and a new set of passengers have been loaded onto a boat, the dispatch conveyor 112 will move the boat forwardly onto the down ramp 114. The boat will roll downwardly over the rollers 128 and 130 under the influence of gravity until it returns to the water within the exit portion of the first branch 20 of the waterway W. It should be particularly noted that the portion of the first branch 20 forwardly of the down ramp 114 is curved towards the main waterway W, as indicated at 140. In order that the boats will pass downwardly over the down ramp 114 with a minimum of frictional resistance the lower rollers 128 of the down ramp 114 are vertically casted. Because of such casting these rollers 128 will be able to pivot with the rear portion of a boat B as the front portion thereof follows the curved part 140 of the first branch 20.

As indicated previously herein, the belts 116 of the lift conveyor 110 are caused to rotate by means of an electric



motor 119 that drives the rollers 118. It is contemplated that such electric motor or motors will normally be running during operation of the ride. When the bow of a boat B being lifted by the lift conveyor 110 reaches a position adjacent stern of a boat disposed upon the dispatch conveyor 112 the electrical motor 119 driving the conveyor belts 116 will be automatically shut off by means of an electric limit switch 142. The limit switch 142 is similar to switches 84 and 86 described hereinbefore and includes a wand 144 disposed in the path of the boats B. Another electric limit switch 146 similar to switches 84, 86 and 142 is positioned adjacent one side of the dispatch conveyor 112. Limit switch 146 is provided with a wand 148 disposed in the path of the boats B.

The limit switch 146 is adapted to control the electric motor 123 that drives the conveyor belts 120 of the dispatch conveyor 112. During normal operation of the amusement ride this electric motor 123 will be in constant operation until the wand 148 of limit switch 146 is engaged by a boat moving along the dispatch conveyor 112. The limit switches 142 and 146 are both electrically connected to a dispatch switch 150 located on the loading station platform 24 by wiring 151. Dispatch switch 150 may be overcontrolled by means of the aforementioned control panel 93, such switch being connected to the control panel by wiring 152. The construction of lift conveyor 110a, dispatch conveyor 112a, down ramp 114a and the parts associated therewith are identical with the aforedescribed construction of such members disposed within the first branch 20 of waterway W.

In the operation of the aforedescribed apparatus it should be assumed that the water within the waterway W is continuously moving from left to right with respect to FIGURES 1, 2, 5 and 7, as indicated by the directional arrows in FIGURE 1. Such water movement will cause the boats B to travel through the waterway W at a generally constant velocity. The boats B will be loaded and unloaded in the area shown in FIGURE 1.

To achieve a maximum turnover of boat passengers it is necessary that the boats be successively switched between waterway branches 20 and 22. This switching is obtained by means of the gate 74. Thus, referring to FIG. 5, the boat B-1 is shown moving along waterway branch 22 while boat B-2 is shown moving along waterway branch 20. A third boat B-3 is shown being directed into waterway branch 22. The next boat B-4 will be directed into waterway branch 20. The boat B-3, as shown in solid outline in this figure, is just entering waterway branch 22. When the rear guide wheel 58 of boat B-3 clears the gate 74, the gate will be switched to its dotted outline position 74' of FIGURE 5 whereby the gate 74 will direct the guide wheels 56 and 58 of boat B-4 into guide trough 36a of waterway branch 20. The gate 74 is pivoted to its dotted outline position 74' when the boat B-3 assumes its dotted outline position shown in FIG. 5. In this position, the starboard side of the boat B-3 will engage the wand 90 of electric limit switch 96 so as to move the wand from its solid to its dotted outline position in the figure. Such wand movement will serve to trip the limit switch 86 whereby such switch will actuate the solenoid valve unit 91 to direct air into cylinder and piston unit 80 to thereby extend plunger 80a relative to the cylinder. This will cause gate 74 to be automatically pivoted to its position designated 74' in FIGURE 5. When boat B-4 has entered guide trough 36a of waterway branch 20 and engages wand 88 of electric limit switch 84 the solenoid unit 91 will cause the unit 80 to again be actuated by in a reverse direction so as to retract plunger 80a and thereby return the gate 74 to its solid outline position of FIGURE 5. The next boat behind boat B-4 will accordingly be automatically directed into waterway branch 22.

It should be particularly noted that the limit switches 84 and 86 may be manually overcontrolled from the control panel 93. This arrangement makes it possible to

constantly position the gate 74 in one position or the other so as to direct all of the boats into either waterway branch 20 or branch 22. Thus, should a breakdown occur in the mechanisms arranged in either of these two branches, all of the boats may be temporarily directed into the other branch. The branch wherein the malfunction has taken place may then be dammed off and repairs made to the mechanisms disposed therein without requiring that the entire ride be shut down during such repairs.

It should also be noted that the provisions of the cable or cables 64 between the front and rear splitters 60 and 62 of the boats insures that once the front guide wheel 56 of a boat B enters a guide trough, the gate 74 cannot be inadvertently swung into the confines of such guide trough before the rear guide wheel 58 has passed by the gate. Should the gate be permitted to swing into the guide trough before the rear guide wheel has cleared the gate, the boat would broach within the waterway thereby requiring that the ride be shut down until the boat could again be straightened out in one of the branches 20, 22. Such inadvertent actuation of the gate 74 could occur in the event of a power interruption or other malfunction. Assuming the gate does swing out of its original position towards a guide trough after the front guide wheel has entered such guide trough, the cables 64 would merely slide along the gate and the rear splitter until the boat clears the gate. The provision of the front splitter 60 insures that the gate 74 will be urged to one side or another relative to the guide troughs 36a and 36b even though the gate might not open completely.

Referring to FIGURE 7, when a boat B is deposited upon the lower end of either lift conveyor 110 or 110a it will be pulled forwardly therealong by the belt 116, such belt being normally operative until wand 144 of limit switch 142 is moved out of its normal position. When the boat reaches the elevated position indicated in dotted outline in this figure it will engage wand 144 of limit switch 142 and cause the latter to trip this switch thereby stopping operation of the electric motor 118 driving belts 116. The boat will accordingly automatically come to a halt to the rear of the stern of a boat positioned upon dispatch conveyor 112. When the boat supported upon dispatch conveyor 112 has received a new load of passengers, an operator positioned upon loading station platform 24 will actuate dispatch switch 150 to thereby re-start the electric motors of both lift conveyor 110 and dispatch conveyor 112. The boat disposed upon the dispatch conveyor 112 will accordingly be moved forwardly onto the down ramp 114 and the force of gravity will serve to transfer such boat downwardly over the down ramp and back into the waterway. The boat originally positioned upon lift ramp 110 will be moved forwardly onto the dispatch conveyor 112 and will continue its forward motion until it engages wand 148 of limit switch 146. Upon such engagement the limit switch 146 will stop the electric motor 123 that operates the dispatch conveyor 112 whereby such boat may be loaded and unloaded.

It should be particularly noted that the dispatch switch 150 may be manually overcontrolled from the control panel 93. This will insure that a boat is not moved back into the waterway until the preceding boats have cleared the exit end 67 of the waterway section shown in FIGURE 1. It is accordingly desirable that the control panel 93 be arranged in a position from which the operator thereof has a clear view of the entire loading-unloading area. This eliminates the possibility that an operator of the dispatch conveyor 105 and 105a might inadvertently dispatch a boat into the waterway before there is adequate clearance therefor.

It will be apparent to those skilled in the art that various modifications and changes may be made with respect to the foregoing detailed description without departing from the spirit of the invention or the scope of the following claims.



We claim:

1. Boat amusement ride apparatus comprising:
  - a continuous waterway having a passenger loading station;
  - a plurality of boats buoyantly supported in said waterway;
  - an upwardly inclined lift conveyor at said station that lifts said boats relative to the water in said waterway to a non-buoyant position;
  - a dispatch conveyor adjacent said lift conveyor that receives said boats from said lift conveyor and temporarily supports said boats in a horizontal and non-buoyant position to receive and discharge passengers;
  - a down ramp adjacent said dispatch conveyor that receives said boats from said dispatch conveyor and returns said boats under the influence of gravity to said waterway in a buoyant condition;
  - power-operated means that drive said lift conveyor and dispatch conveyor;
  - and control means for automatically actuating said power-operated means responsive to the position of said boats relative to said conveyors.
2. Apparatus as set forth in claim 1 wherein said control means include wand means disposed in the path of said boats adjacent said conveyors.
3. Apparatus as set forth in claim 2 wherein said power-operated means include electric motor means and said control means include electric switches inter-connecting said electric motor means and said wand means.
4. Apparatus as set forth in claim 3 wherein said control means include a manual overcontrol for said electric switch means.
5. Boat amusement ride apparatus, comprising:
  - a continuous waterway having a single main portion and a loading-unloading section that is bifurcated to provide first and second branches, said main portion of said waterway being formed with a single guide trough at its lower portion that merges into first and second auxiliary guide troughs formed in said first and second branches;
  - a passenger-loading station in each of said branches;
  - a plurality of boats buoyantly supported in said waterway;
  - guide wheels depending from each of said boats that travel in said guide trough to guide said boats along said waterway in a fixed and predetermined path;
  - a vertically extending control gate disposed in said single guide trough at the entrance to said first and second branches to selectively direct the guide wheels of said boats into either said first branch or into said second branch;
  - means for automatically actuating said control gate responsive to the movement of said boats through said first and second branches;
  - an upwardly inclined lift conveyor at each of said stations that lifts said boats relative to the water in said waterway to a non-buoyant position;
  - a dispatch conveyor adjacent each said lift conveyor that receives said boat from each said lift conveyor and temporarily supports said boat in a horizontal and non-buoyant position to receive and discharge passengers;
  - a down ramp adjacent each said dispatch conveyor that receives boats from each said dispatch conveyor and returns said boats under the influence of gravity to said waterway in a buoyant condition;
  - power-operated means driving said lift conveyors and dispatch conveyors;
  - and control means for automatically actuating said power-operated means responsive to the position of said boats relative to said conveyors.
6. Boat amusement ride apparatus, comprising:
  - a continuous waterway having a single main portion and a loading-unloading section that is bifurcated to provide first and second branches, said main portion

- of said waterway being formed with a single guide trough at its lower portion that merges into first and second auxiliary guide troughs formed in said first and second branches;
  - a plurality of boats buoyantly supported in said waterway;
  - guide wheels depending from each of said boats that travel in said guide trough to guide said boats along said waterway in a fixed and predetermined path;
  - a vertically extending control gate disposed in said single guide trough at the entrance to said first and second branches to selectively direct the guide wheels of said boats into either said first branch or into said second branch;
  - means for automatically actuating said control gate responsive to the movement of said boats through said first and second branches;
  - and front and rear struts on said boats that each support one of said guide wheels, said boats also having splitter elements affixed to said struts and cables extending between said struts.
7. Boat amusement ride apparatus, comprising:
    - a continuous waterway having a single main portion and a loading-unloading section that is bifurcated to provide first and second branches, said main portion of said waterway being formed with a single guide trough at its lower portion that merges into first and second auxiliary guide troughs formed in said first and second branches;
    - a passenger-loading station in each of said branches;
    - a plurality of boats buoyantly supported in said waterway;
    - guide wheels depending from each of said boats that travel in said guide trough to guide said boats along said waterway in a fixed and predetermined path;
    - a vertically extending control gate disposed in said single guide trough at the entrance to said first and second branches, said control gate being movable between a first position that blocks the entrance to said second branch and a second position that blocks the entrance to said first branch whereby said boats will be selectively directed into either said first branch or said second branch;
    - power-operated means for moving said control gate between said first and second positions;
    - and control means for said power-operated means including wand means disposed in said first and second branches to be engaged by said boats.
  8. Apparatus as set forth in Claim 7 wherein said control means include electric switching means operatively connected to said wand means.
  9. Apparatus as set forth in Claim 8 wherein said control means include a manual overcontrol for said electric switch means.
  10. Boat amusement ride apparatus, comprising:
    - a continuous waterway having a single main portion that is bifurcated to provide first and second branches, said main portion of said waterway being formed with a single guide trough at its lower portion that merges into first and second auxiliary guide troughs formed in said first and second branches;
    - a plurality of boats buoyantly supported in said waterway;
    - front and rear struts depending from each of said boats;
    - guide wheels carried by said struts that travel in said guide trough to guide said boats along said waterway in a fixed and predetermined path;
    - an elongated element extending between said front and rear struts;
    - a vertically extending control gate disposed in said single guide trough at the entrance to said first and second branches, said control gate being movable between a first position that blocks the entrance to said second branch and a second position that blocks the entrance to said first branch whereby said boats will



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be selectively directed into either said first branch or said second branch;  
 power-operated means for moving said control gate between said first and second positions;  
 and control means for said power-operated means including wand means disposed in said first and second branches to be engaged by said boats. 5  
 11. Apparatus as set forth in claim 10 wherein said control means include electric switching means operatively connected to said wand means.  
 10  
 12. Apparatus as set forth in claim 11 wherein said control means include a manual overcontrol for said electric switch means.

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