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2,940,214

REMOTE CONTROL TOY WATERWAY

Filed March 18, 1958

2 Sheets-Sheet 1

Fig. 1.

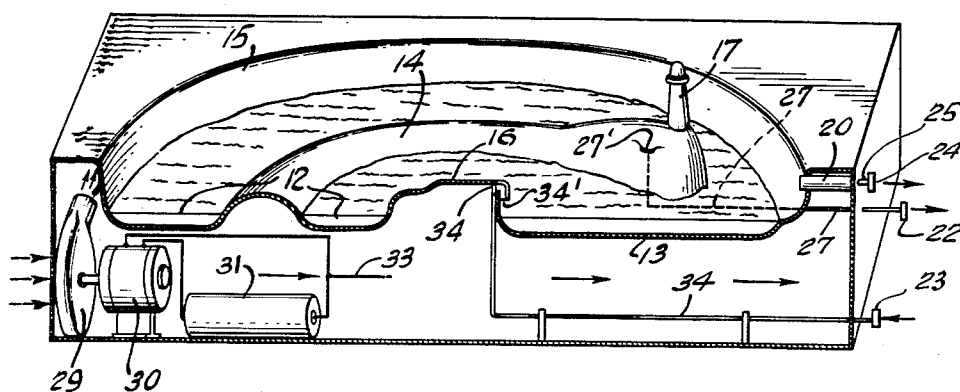
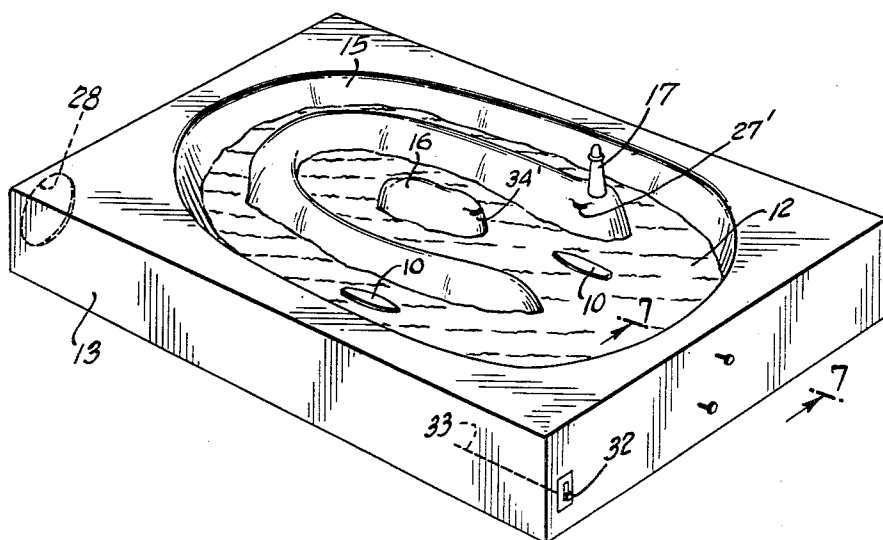


Fig. 2.



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Fig. 3.

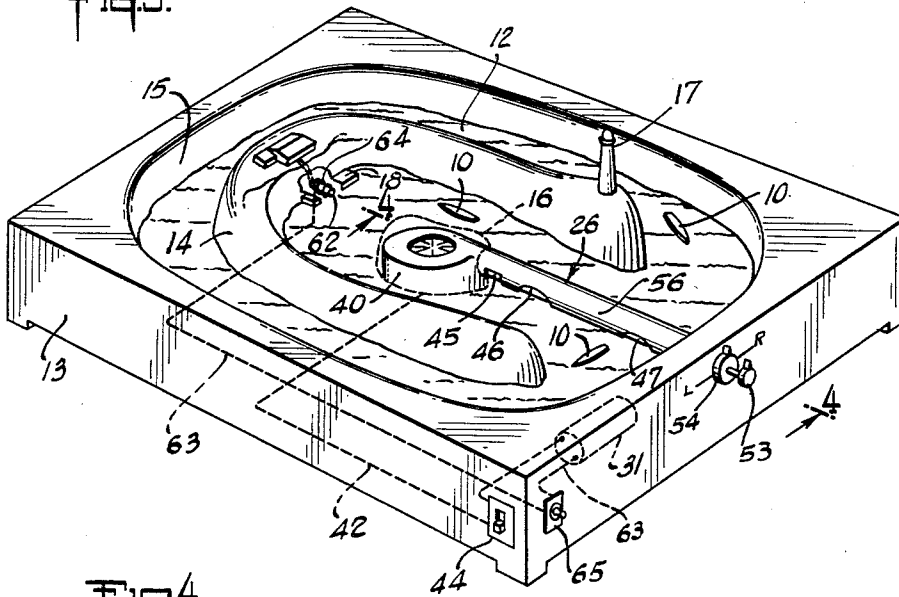


Fig. 4.

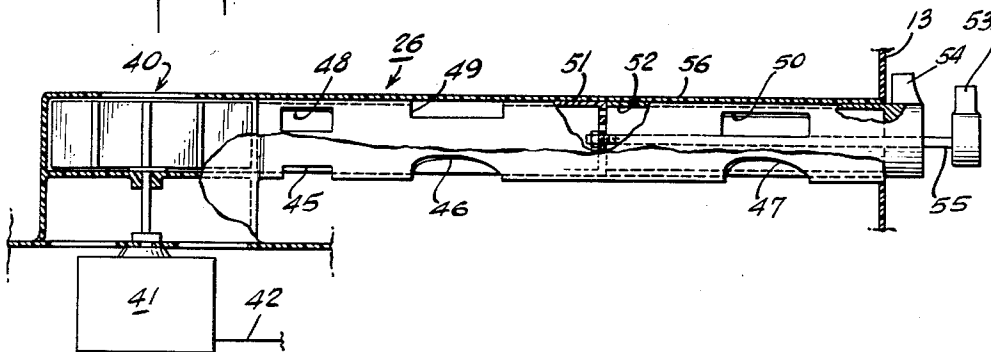


Fig. 5.

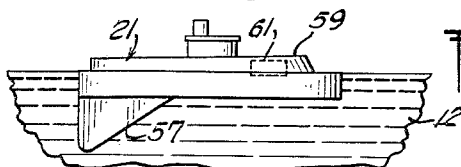
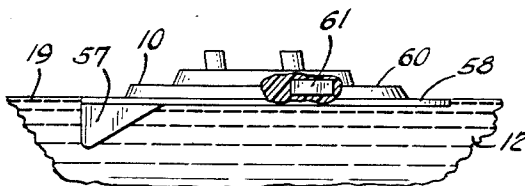
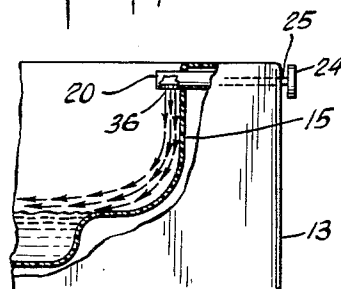


Fig. 6.

Fig. 7.



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REMOTE CONTROL TOY WATERWAY

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2 Claims. (Cl. 46—91)

This invention relates to a toy incorporating a novel system of propulsion and controls for remotely controlling movements of miniature boats in a waterway system. Pursuant to the invention, air pressure is utilized for controlled movement of the toy boats and for changing their direction of movement through laminar flow of the surface layer of the water, attained by directing streams of air across the surface layer.

Pursuant to the invention, as will become apparent from the description below, means are provided for controlling movement of the boats on the waterway relative to each other and through said waterway. Movement of one or more boats at the same time may thus be controlled; the boats may be caused to move in and out of inlets from one waterway to another—one boat may be caused to go in one direction and others in the opposite direction at the same time and one may be docked while the others continue to move; the docked boat may be caused to leave the dock at the will of the operator. A boat proceeding in one direction may be caused to turn and move in the opposite direction, and one boat, such as a speed boat may be caused to go faster and pass a slower boat, such as a tug boat. The speed of the boats may be increased or decreased at the will of the operator, all of the above being attained, pursuant to the invention, without the operator actually touching the boats or the water.

Examples of practical devices embodying the invention are described below and in the accompanying drawings; the invention is not limited thereto, but covers all other forms coming within the scope or purview of the disclosure herein.

In the drawings:

Fig. 1 is a medial, longitudinal sectional view of a remote control toy waterway system embodying the invention,

Fig. 2 is a perspective view thereof,

Fig. 3 is a similar view of another form thereof,

Fig. 4 is an enlarged, partly broken, sectional view, taken on line 4—4 of Fig. 3,

Fig. 5 is a schematic, partly sectional, view of a boat adapted for use in carrying out the invention shown on a waterway,

Fig. 6 is a similar view of another form thereof, and

Fig. 7 is an enlarged, fragmentary, sectional view, taken on line 7—7 of Fig. 2.

The device of this invention, as will appear from the accompanying drawings and description below, is designed to enable the operator to readily control the movement of miniature boats, such as indicated at 10 in Figs. 2 and 3 and at 60 and 59 in Figs. 5 and 6 of the drawings, in a waterway defined by a base portion 13 and portions such as 14, 15, 16 of any desirable or convenient form rising therefrom and defining, for example, waterways, an inlet therebetween and an island portion 16. The arrangement of waterways is subject to infinite variations pursuant to the invention; supplementary or additional devices may

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be used to enhance the effect, such as forming a light-house replica 17 on portion 14 and forming simulated dock 18 (Fig. 3) extending from the portion 14.

Pursuant to the invention means are provided enabling the operator of the game to control and move surface layer 19 (Fig. 5) of the water 12 at various points, as presently more particularly described. The air blown on the water at a certain point not only moves the water at that point but moves the whole surface layer of that particular channel in the direction of the air flow. In case of the inlet, most of the surface layer in the inlet, flows from outside to inside while the boat is being sent in. At the same time most of the water in the outside channel is at a stand still. Compressed air is used for the purpose, and discharge valves are provided for the controlled discharge thereof. To that end, as shown, for example, in Fig. 1, the base member 13 may be essentially hollow and sealed except for the control valves and air inlet 28 (Fig. 2) in a side wall of the base portion and opening into a blower 29 (Fig. 1) for compression of air and discharge thereof into the hollow base portion. The blower may be actuated by a motor 30 driven by house current or by batteries such as 31 (Fig. 1) controlled by switch 32 (Fig. 2) through cable 33.

In the form shown in Figs. 1 and 2, valves 27 and 34 are provided for control of the air discharge apertures 27', 34', in the portions 14, 16 of base 13. The valves may be of any desired type pushed or pulled to actuate the same as indicated by the arrows (Fig. 1) adjacent the knobs 22, 23 for valves 27, 34. The valves may be of the type (Fig. 7) rotated to register a discharge opening therein with the opening 36 in an apertured casing 20, constituting the air discharge aperture in the portion 15.

By selectively operating the valves, compressed air may be directed onto the surface of the body of water 12 at various points so as to control movement of one or more boats selectively or simultaneously and cause said boats to go in and out of inlets and from one waterway to another. One boat may thus be caused to go in one direction, and another in the opposite direction at the same time. A boat going in one direction may be caused to turn around and start back in the opposite direction and one boat, such as a boat 10, Fig. 5, to move faster and pass a slower boat, such as heavier boat 21 of Fig. 6. Speeds and direction of movement of the boats may be increased or decreased without touching the boats or the water.

Pursuant to the invention, the boats are moved by laminar flow of the surface layer 19 in contrast to the main body 12 of liquid by air blown across the surface, layer at an angle from the vertical. The complete body of water does not necessarily flow. If the air flow is parallel with the walls of the portions 14, 15, 16, the discharge apertures (such as 27', 34') will operate satisfactorily even if high above the surface 19. If the flow of air is perpendicular to the wall, such as at the inlet between the waterways, the discharge aperture should be almost at the water line (which might be disadvantageous) or the wall constructed to arcuately meet the waterline as shown in Fig. 7 so that air blowing down the wall will be deflected in direction from discharge aperture 36 substantially above the water line to change direction from vertical to horizontal flow as the air reaches the waterline, preventing a "still" or "dead spot" at the point where the water meets the wall.

Fig. 3 illustrates another form, the compressed air source there being a blower 40 actuated by motor means 41 (Fig. 4) connected by cable 42 and control switch 44 with an electric source such as batteries indicated at 31. The blower 40 discharges compressed air into the hollow interior (Fig. 4) of valve casing 26 which may simulate the appearance of a bridge, and which may have

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the discharge apertures 45, 46, 47 at the lower portion thereof; apertures 48, 49 of the tube 51 and aperture 50 of tube 52 may be rotated into registry therewith by the control knobs 53 (for tube 51) and 54 (for tube 52). The operating knob 54 may be directly connected to the tube 52; operating knob 53 may be connected to the tube 51 by shaft 55 passing through knob 54 and tube 52.

In the arrangement shown in Fig. 3, the tube 51 controls the inside waterway, which is open at both ends, and the tube 52 controls the outside waterway which has its outside end closed. Each knob 53, 54 may be turned independently of the other. The openings 46, 47 of the casing 56 for the valve 26 are twice as wide as are the corresponding slots 49, 50 in the tubes 51, 52 so that air may be discharged from one side of said opening 46 or 47 at any one time. The curved slot 47 is so designed as to cause the air discharged therethrough to flow straight down the wall portion when the slot 50 is in the center of the discharge aperture 47. The discharge aperture 45 of the casing 26 is a straight slot so that the air discharged therethrough will flow straight down. The curved discharge aperture or slot 46 is located inwardly of the ends of the base portion 14 so that air discharged therethrough will blow parallel to the channel and nearer to the island 16. The closer slot 46 is placed to the island 16, which in the Fig. 3 form would partly cover the blower, the more perpendicularly it will discharge air relative to the channel.

The boats 10 are preferably formed with keels 57 (Fig. 5) projecting through the surface layer 19 and into the underlying layers of water 12 keeping them headed in the direction in which they are moving and said boats preferably have flat bottoms and little draught (as noted at 58, Fig. 5) so that the boat will ride with the surface layer 19 of water. A heavier boat, as for example, tug boat 59 (Fig. 6) would have a deeper draught than a speed boat. The deeper the draught, the slower the boat will move for the same amount of force exerted upon it. A heavier boat would have a thicker hull or an obstruction on the keel or any other means to cause a drag against the under layers of water. The deck portions of the boats may be waxed to break the capillary action of water and prevent boats which may be passing each other closely from being attracted toward each other. The boat decks may be waxed, greased, silicon coated or otherwise treated to keep the water from wetting the deck.

The boats are made lighter than water so that they will float under any condition and they would normally extend into the air above the water level. In so doing they would create a concave (if the boats were wetted) or convex condition (if not) on the adjacent water surface. If similar conditions existed on the water surfaces around the boats and at the casing walls at the water level (due to the wetting of the boats and the walls of the casing), the boats would stick to the casing walls when moved close thereto. Hence the deck portions of the boats are waxed or otherwise coated or treated to break up the capillary action of the water and keep the water from wetting the deck. By weighting the boat to move it down in the water so that its deck will be flush with the water, the concave condition above mentioned surrounding the boat would not occur and the boat will not adhere to the wetted wall of the casing when positioned close thereto. If a water repellant is used on the boat deck with the deck flush with the water, the deck will not become wet and a convex condition of the water surface around the boat is attained. Opposite conditions of the water surfaces at the casing walls and boat providing opposite conditions of their surrounding water surfaces, set

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up repelling forces which keep the boats from sticking to the walls. The casing walls being vertical or nearly so make it difficult to maintain a convex condition at the water level. The walls could be waterproofed and the boats allowed to become wet but this is obviated by forming the casing walls curved at the water level (Fig. 7).

The boats will stick together if they approach each other at close range but they separate readily when passing under an air flow.

If conditions are allowed to exist causing a boat to stick to a wall, the boat will not travel three inches before it is attracted to a wall and will not leave the wall until taken off by hand. The boats may be provided with (Figs. 5 and 6) pieces of ferrous metal 61 so the electro-magnet 62 at the dock may attract the boat when it is desired.

A magnetic member may be provided in a portion of the base 13, as, for example, by providing the member 62 in the simulated dock 18 in Fig. 3, to be controlled by passing a current through cable 63; and switch 65 to the batteries 31, through a coil 64 surrounding the member 62. Thus the operator may magnetize member 62 and thus dock 18 at such times as desired, to attract certain boats thereto and permit others to pass therebeyond without being attracted thereto, and to release boats so attracted to the magnetic dock therefrom when desired.

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

1. A remote control, boat-waterway game, comprising a hollow, essentially sealed casing having an upper face formed in simulation of a waterway bed and of portions rising therefrom in watertight relation defining therewith a waterway bed in which water may be placed and one or more miniature boats positioned therein, at the top of said casing creating the effect of a body of water used by boats, a compressed air source in said casing for filling the casing with compressed air, the upper face of the casing having an apertured portion located above the customary water line and a valve casing positioned in and extending through said apertured portion of the casing, said valve casing having a discharge aperture directed toward the surface of the water, a valve head movably disposed in said valve casing and selectively movable against said apertured portion of the valve casing to close said apertured portion and away from said apertured portion to open the same for discharge of said compressed air, and means connected to said valve head, to be moved by the operator of the game, to control movement of the valve head against and clear of the discharge aperture, so that air may be discharged against the surface of the water at the will of the operator, to thus move the surface of the water and thereby move said boats.

2. In a remote control game as set forth in claim 1, a portion rising from said upper face of the casing being curved at the water line and said compressed air discharge aperture being so juxtaposed relative to said portion that the air discharged therefrom will flow downwardly along said portion and be deflected thereby onto the surface layer of the water in a path substantially parallel to the surface of the water.

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