March 17, 1964 C. C. NIELSEN 3,125,339

RECREATIONAL AND TRAINING APPARATUS FOR WATER SKIERS

Filed Jan. 2, 1962

2 Sheets-Sheet 1

Fig. 1.

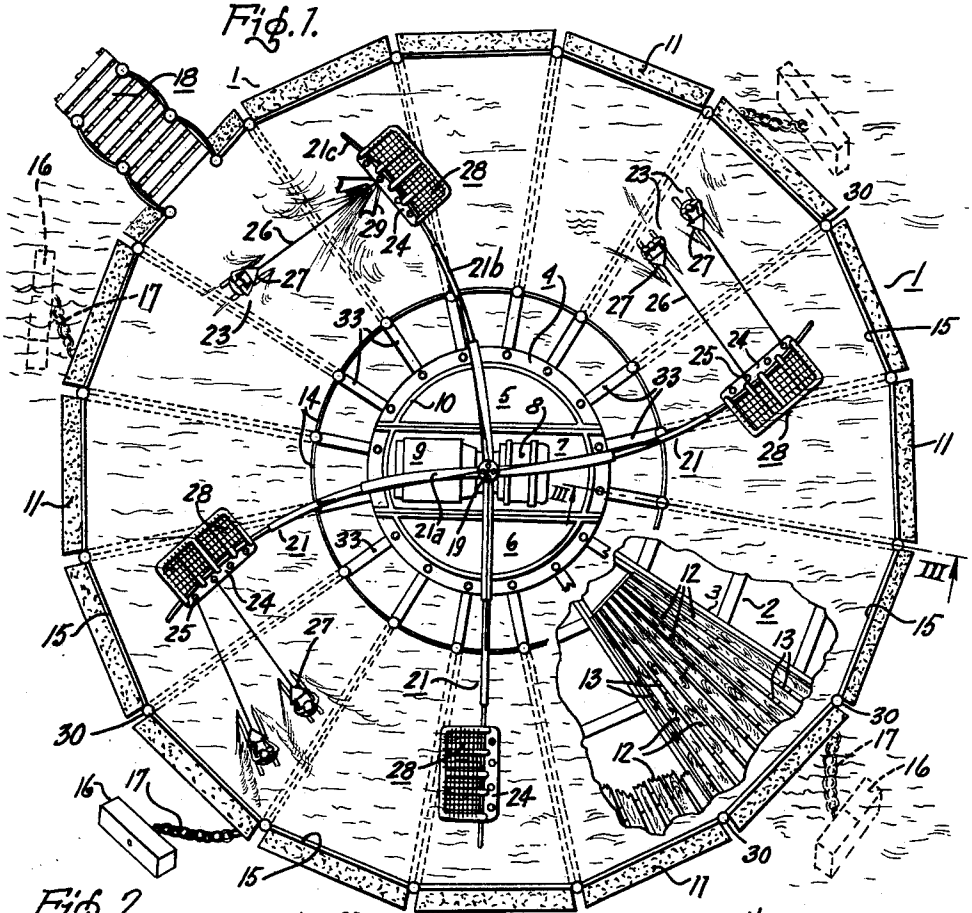
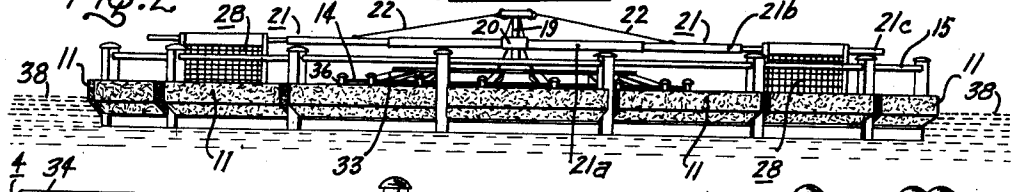


Fig. 2.



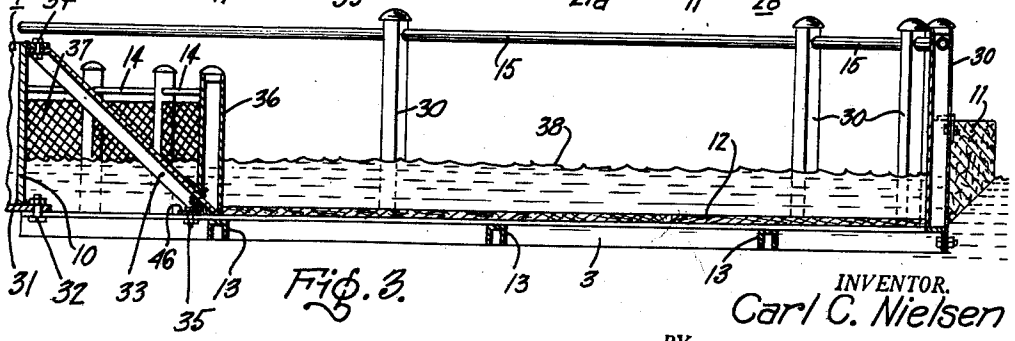


Fig. 3.

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Fig. 4.

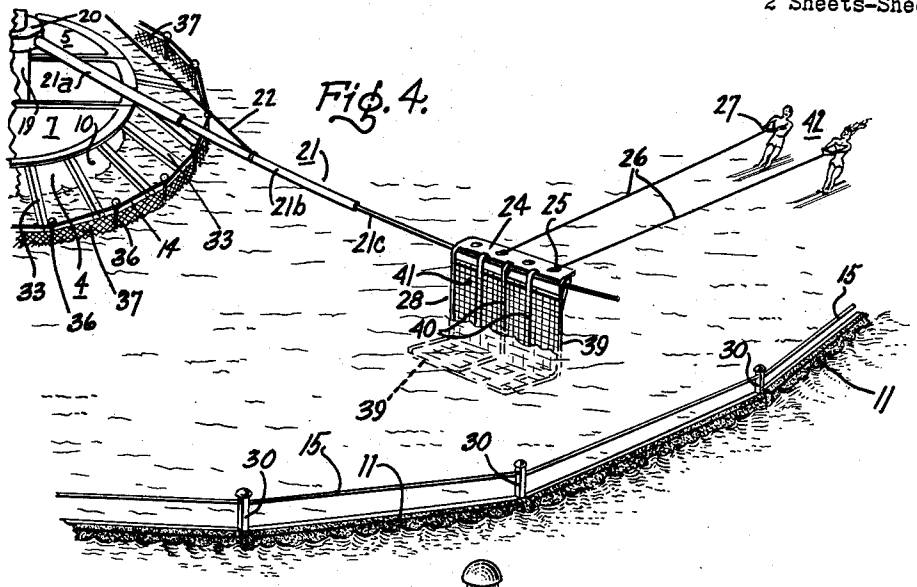
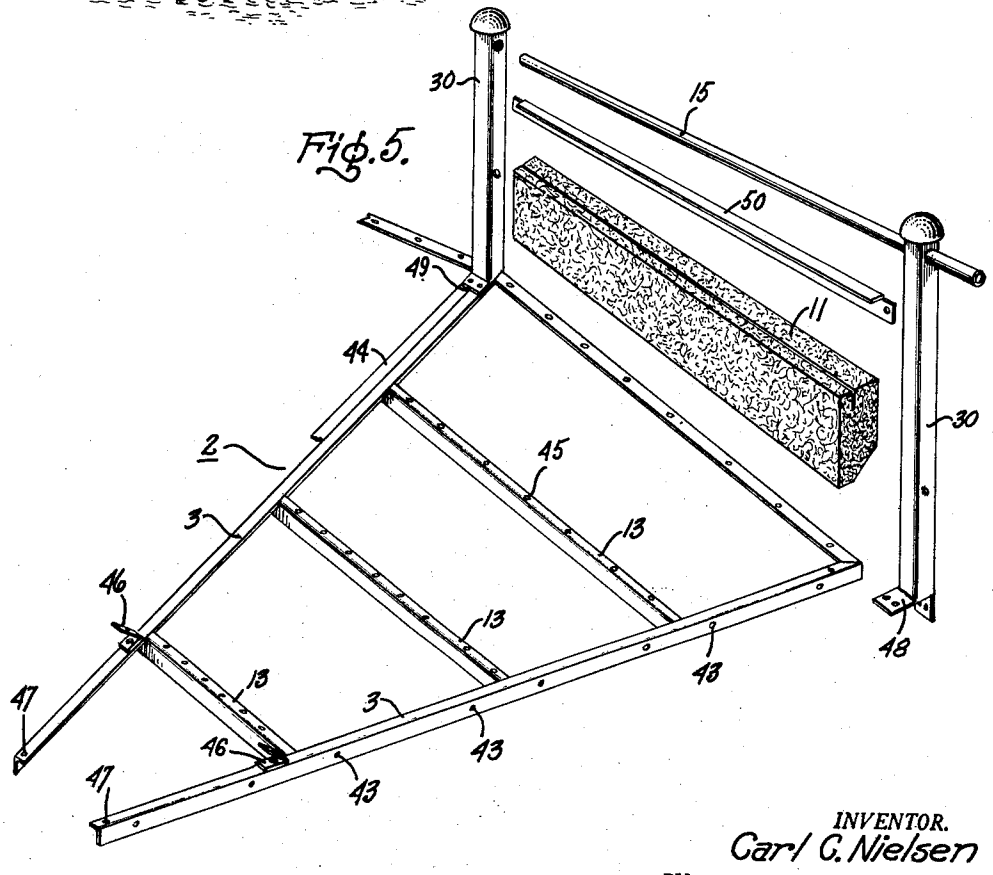


Fig. 5.



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RECREATIONAL AND TRAINING APPARATUS FOR WATER SKIERS

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11 Claims. (Cl. 272—32)

This invention relates to an improved recreational and training device for enabling persons to learn the skill of water skiing with relative ease and safety and under conditions simulating those of being towed by a boat in deep water.

Although water skiing is an enjoyable sport for skilled skiers, there are inherent dangers connected with the sport for inexperienced skiers. For the novice and for children, it would be desirable to provide apparatus which would simulate the actual experience of being towed by a boat in deep water without the dangers attached thereto. Also for the inexperienced skier, there are many unaccustomed sensations, such as the sudden shock of starting, the tendency of the skis to slip sideways in a turn, the disturbances of the water caused by the wake of the tow boat, etc.

Also since actual water skiing involves a considerable expense it would be desirable to have a device for teaching the skill of water skiing at relatively litle expense. Also, it would be desirable to provide water skiing recreational apparatus which would simulate a variety of conditions which could be adjusted according to the skill of the skier. At the same time the apparatus should be relatively accessible for use by large numbers of the public at parks and beaches with a minimum of capital investment, in order to cause the use of the apapratus to be relatively inexpensive.

Accordingly, one object of the present invention is to provide an improved water skiing training device, which will allow a novice to learn the sport in comparative safety.

Another object of the present invention is to provide a recreational device, which will permit more experienced water skiers to improve their skill with relatively little inconvenience, expense, and under a variety of conditions simulating being towed by boat in open water.

Still another object of the invention is to provide a water skier's recreational and training apparatus, which may be dismantled for transportation to various recreational centers such as parks and beaches.

Another object of the invention is to reduce the size of the drive motor required to power an apparatus such as that described.

These and many other objects of the invention will become apparent from the concluding portion of the specification taken in connection with the accompanying drawings in which:

FIG. 1 is a plan view of the water skiing apparatus in use, with a portion of the water surface removed to show construction features;

FIG. 2 is an elevation view of the apparatus of FIG. 1;

FIG. 3 is a cross sectional view through one of the floatable frame sections taken along lines III—III of FIG. 1;

FIG. 4 is a perspective view of one of the radial traction arms of the invention; and

FIG. 5 is an exploded perspective view of one of the floatable frame sections of the invention.

Generally stated, the invention is practiced by providing a number of floating frame sections which are attached to enclose a relatively shallow body of water over a flat submerged deck. A number of traction arms are arranged to extend over the shallow water area and to move across the water and to tow skiers by means of atached tow handles. Each of the arms supports a catching net which

serves to protect fallen skiers, to smooth the water before novice skiers, or to attach various devices to simulate towing behind a boat in open water.

Referring now to FIG. 1 of the drawing, a circular enclosure, shown generally as 1, is made up a number of pie-shaped open frame sections 2, attached to one another along radial legs 3 thereof. The ends of radial legs 3 are attached to a water tight floating housing shown generally as 4 at the center of enclosure 1. Housing 4 may be constructed in any suitable manner, but as shown here comprises an assembly of two segmental portions 5, 6 attached to a central portion 7. Disposed in the central portion 7 of housing 4 is a drive motor 8 which may be electric, gasoline or diesel and a suitable gear box and speed control mechanism 9. The housing sections 5, 6, 7 may be bolted together for ease of assembly and when attached, they provide a vertical circular wall 10 for keeping water out of the gear box and motor and for providing buoyancy.

Each of the frame sections 2 is supported in the water along its radially outer edge by a floatation device 11, which may be of any suitable type such as any one of the buoyant foam solids commercially avialable, or such as hollow metal tanks or inflatable bags. The flotation members 11 and the housing 4 together serve to support the enclosure or framework 1 in a partially submerged state. The weight of the structure is carefully designed with relation to the size of housing 4 and the buoyancy of flotation members 11 so as to provide a relatively shallow constant depth body of water inside enclosure 1.

As seen from the broken away portion of FIG. 1, each of the frame sections 2 has a flat open deck so as to provide access of water through the floor. In the embodiment shown, the floor is preferably made up of spaced wooden boards 12, running in a radial direction and attached to underlying metal cross pieces 13 of the frame sections 2. The radial boards 12 cover the complete floor between an inner guard rail 14 and an outer guard rail 15.

The enclosure 1 is preferably moored relatively close to shore or to a deck by means of anchors 16 and chains 17. For reasons which will become apparent later, chains 17 are provided with a slight amount of slack. A gangway 18 leading to the shore or a deck (not shown) provides access to the body of water inside enclosure 1.

The drive motor 8 and gear box 9 serve to turn a vertical shaft 19 as may be seen by reference to FIGS. 1 and 2 and 4. Attached to shaft 19 by a suitable hub 20 are a number of relatively flexible radial traction arms 21 which are preferably supported near their midpoints by guy wires 22. Although arms 21 can be of any suitable structural cross sectional shape, such as I-sections, round pipes, etc., they are preferably formed by telescoped pipe sections such as 21*a*, 21*b*, 21*c*, etc., with the smaller and lighter sections toward the ends of the arm. The flexibility of the arms is indicated by the three arms which are bent due to the load imposed by skiers 23. The flexibility of the arms serves to more closely simulate the feeling of being towed by a boat where the tension is varied by the maneuvers of the skiers.

Attached near the outer end of each traction arm 21 is a bar 24 with suitable connectors 25 for attaching tow handles 26, which may either be of flexible cable or of rigid rod depending on the desired realism. The ends of tow handles 26 are, of course, adapted for gripping by a skier as indicated at 27.

Also attached on the ends of arms 21 are catcher nets 28 which extend into the water and serve to pick up a fallen skier drawn by a preceding arm 21, and which also serve other functions, such as quieting the water for inexperienced skiers as will be explained later, or to provide means for attaching a device such as wedge-shaped plow 29 to simulate the wake of a boat.

Referring now to FIG. 3 of the drawing, it will be seen that each radial structural leg 3 of frame sections 2 is connected at the outer end thereof to a vertical post 30, which carries flotation devices 11 and also an outer guard rail 15.

The vertical wall 10 of housing 4 is welded at its lower end to the floor 31 of housing 4. The inner ends of radial legs 3 are bolted to the floor 31, as indicated at 32. A number of angle braces 33 also serve to secure brackets 46 on radial legs 3 to housing 4 by means of the bolted connections 34 and 35.

Thus housing 4 can be removed from the frame sections 2 by disconnecting bolts 32, 34, 35 in order to facilitate dismantling and transporting of the apparatus. A vertical post 36 is welded to each angle braces 33, and serves to support an inner guard rail 14 and a safety screen 37.

It may also be seen that the planking 12 provides a flat smooth surface and that the water level indicated at 38 is relatively shallow and of constant depth throughout. The depth of the water 38 is such as to allow a moving skier to be supported without touching the floor.

Reference to FIG. 4 of the drawing indicates more clearly the construction of the catcher net 28. An outer continuous rod 39 in the shape of a bent U and a number of intermediate L-shaped rods 40 are rigidly attached at their upper ends to arm 21. The vertical portions of rods 39, 40 is such as to suspend the horizontal portions of the rods slightly above the planking 12. The clearance distance should be just great enough so that the bottom of the rods will not drag the planking 12 under the weight of the skiers. A safety net 41 is attached to the rods 39, 40 which performs a dual function. First, it serves to protect a fallen skier and to scoop him up on the catcher net 28 if he should happen to fall in the path of oncoming skiers 42. Secondly, the mesh size of the screen 41 is selected so as to provide smoothing of the water ahead of the skiers 42. This smoothing of the water is very helpful for novice skiers. If desired, however, a plow member 29 (FIG. 1) can be provided as an accessory attachment to catcher net 28 to simulate the wake of a boat, thus giving a variety of skiing conditions.

Reference to FIG. 5 of the drawing indicates one suitable construction for the frame sections 2. Sections 2 are pie-shaped with radial legs 3 composed of metal angles secured to channel shaped cross pieces 13 of varying lengths. Radial legs 3 are provided with holes 43 for bolting to similar radial legs of the adjacent frame sections as indicated by a portion of an adjacent leg 44. Cross pieces 13 are also provided with holes 45 for attaching the wooden planking. The brackets 46 and holes 47 for attaching to the housing 4 and angle braces 33 are also indicated. Each of the vertical posts 30 is provided with an angle bracket 48 at its lower end which serve as a common connection for two adjoining frame sections as may be seen by the sections already joined at 49. The flotation block 11 is supported on a cross member 50 by means of bolts (not shown) passing through the flotation member 11 and the cross member 50 into posts 30. The guard rail 15 may be a pipe suitably attached to posts 30.

The operation and advantages of the apparatus will be apparent from the following description. Referring to FIGS. 3 and 5, the pie-shaped frame sections 2 may be transported to a suitable site near the water's edge and assembled, attaching them to one another by bolting together the radial legs 3 and attaching the stay posts 30. The motor housing 4 is attached to the inner ends of the radial legs and the diagonal braces 33 attached by bolting as previously indicated. An alternate method of assembly is to float housing 4 in the water and to attach frame sections 2, one at a time, rotating the assembly in the water to float each new frame section as it is attached.

The necessary buoyancy is provided by the flotation members 11 around the periphery of the framework and by the housing 4 in the center of the framework which, as previously indicated, is watertight and, therefore, also buoyant. The support afforded by the housing 4 and by the flotation members 11 is sufficient to sustain the enclosure in a partially submerged condition so that the water enters the enclosure through the open planking 12 to provide a shallow enclosed body of water within framework 1.

The motor and gear box are selected to turn the vertical shaft 19 in accordance with the desired speed of rotation of the radial traction arms 21.

The flexible arms and the floating enclosure serve to simulate actual water skiing conditions in the following manner. When a skier is being towed by a boat, he will normally start either from shallow water near the shore or from a swimming position in deep water. Full throttle is applied at the boat and there is a sudden jerk as the towline becomes taut. Afterwards there is a short period of increased drag on the boat as the skier is lifted from the water to a planing position. The apparatus pictured in FIG. 1 functions in a similar manner. As the motor and gear box are actuated, the shaft turns and the flexible arms 21 will bend slightly due to the inertia of the skiers.

It is to be particularly noted that the entire framework 1 will rotate in a direction opposite that in which the skiers are to travel due to the reaction of the motor on the housing 4. This continues until the anchor chains 17 become taut. At this point the enclosure 1 can no longer rotate in the opposite direction and the skiers are suddenly moved forward in the water, simulating actual action by a tow boat. After the skiers have reached a planing position, the flexible arms 21 provide an action very similar to that provided by a towboat, since they react so as to slow down momentarily when the skier performs a maneuver adding to the drag in the water, and then speed up thereafter as the drag is decreased.

Another important feature of the invention accomplished by the fact that the driving means is floating and hence free to turn, is that a much smaller motor can be used, thereby reducing the investment. Since the greatest load on the motor is at starting due to the inertia of the skiers, this load is reduced to approximately half of what it would be if the drive motor and its housing were stationary. This is because of the ability of enclosure 1 to rotate in a direction opposite that of the skiers until chains 17 become taut, at which time sufficient rotational energy has been developed to start the skiers without an excessive load on the motor.

In the event that a skier falls, the catcher net 28 of the following arm will retrieve him and hold him safely until the apparatus can be stopped. As mentioned previously, the vertical portions of the screens on catcher nets 28 also serve to smooth the water ahead of inexperienced skiers.

Since the entire enclosure 1 is floating, it is not necessary to provide an expensive installation for teaching water skiing, since the enclosure can be dismantled and moved from one site to another, the only requirement being that there is a body of water of sufficient size for floating the apparatus. Skiers can enter and leave the enclosure over the gangway 18 and can practice or learn to ski in comparative safety.

Many other objects and advantages of the invention will become apparent to those skilled in the art and while there has been described what is at present considered to be the preferred embodiment of the invention, it is desired to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. Recreational and training apparatus for water skiers comprising:

a floating open framework constructed and arranged to have a flat submerged deck portion covered by a relatively shallow area of water,

traction means mounted on said framework comprising a plurality of extending traction arms, which are movable over said water area,

a catching net suspended from each of said traction arms and extending into the water,

a plurality of tow handles attached to said traction arms above said submerged deck portion and adapted for gripping by water skiers, and

means driving said traction means to cause the traction arms to move over said deck portion and shallow water area, whereby water skiers may be pulled across the water by holding said tow handles, each of said catching nets being disposed on the respective traction arm substantially in the path of the skier being towed on the preceding arm.

2. Recreational and training apparatus for water skiers comprising:

a plurality of open frame sections attached to one another to provide a substantially circular framework,

flotation means providing buoyancy to hold said framework in a partially submerged state to define a shallow enclosed body of water within the framework,

traction means comprising a plurality of radial arms extending above the enclosed water area,

a catching net suspended from each of said radial arms and extending into the water,

means disposed on said framework and driving said radial arms in a rotary direction, and

a plurality of depending tow handles attached to said traction arms, whereby water skiers may be towed over the surface of the water in a circular direction by said radial arms by gripping said tow handles, each of said catching nets being disposed on the respective radial arm substantially in the path of the skier being towed on the preceding arm.

3. Recreational and training apparatus for water skiers comprising:

a plurality of open frame sections attached to provide a substantially circular framework, said framework having a flat deck provided with openings to admit water therethrough,

flotation means attached about the periphery of said framework,

a leaktight housing disposed in the central portion of said framework, said housing and said flotation means providing buoyancy to float said framework in a partially submerged condition so as to define a shallow water area above the deck of the framework,

traction means comprising a vertical shaft extending from said housing and having a plurality of radial arms attached thereto and extending out above the water,

a catching net suspended from each of said radial arms and extending into the water,

means disposed in said housing for driving said shaft to move the radial arms in a rotary direction, and

a plurality of depending tow handles attached to said radial arms, whereby water skiers may be towed over the defined water area by gripping said tow handles, each of said catching nets being disposed on the respective radial arm substantially in the path of the skier being towed on the preceding arm.

4. Recreational and training apparatus for water skiers comprising:

a plurality of open frame sections attached to provide a substantially open framework,

flotation means floating said framework in a partially submerged state to define a shallow enclosed body of water within the framework,

traction means comprising a plurality of radial arms rotatable about a vertical axis extending above the water,

means disposed on said framework and driving said arms in a rotary direction, and

a plurality of depending tow handles attached to said radial arms,

each of said radial arms having a catching net supported therefrom and extending into the water substantially in the path of the skier being towed on the preceding arm, whereby skiers falling from a preceding arm can be retrieved by said catching net.

5. Recreational and training apparatus for water skiers comprising:

a plurality of open frame sections attached to one another to provide a substantially circular framework, said framework having a flat deck with openings to admit water therethrough,

flotation means disposed about the periphery of said framework,

a leaktight housing disposed in the center of said framework, said flotation means and said housing providing buoyancy to float said framework in a partially submerged condition so as to define a shallow enclosed body of water above the flat open deck of said framework,

traction means comprising a vertical rotatable shaft and a plurality of radial arms attached thereto and extending out over the defined water area,

motor means disposed in said housing for driving said vertical shaft to rotate the radial arms,

each of said radial arms having L-shaped catching nets suspended from the radial arms into the water including vertical portions extending almost to the deck and horizontal portions extending in the direction of rotation of said arms, and

a plurality of tow handles attached to said radial arms, whereby skiers may be towed over the surface of the water by gripping said tow handles, each of said catching nets being disposed on the respective radial arm substantially in the path of the skier being towed on the preceding arm.

6. The combination according to claim 5 wherein said framework is moored by anchor means allowing a predetermined rotary movement in the water in a direction backward relative to the direction of towed skiers to give sudden acceleration similar to that of a tow boat as said anchor means suddenly halts the backward rotation of said framework, and to reduce the starting load on said motor means.

7. The combination according to claim 5 wherein said radial arms comprise cylindrical sections of decreasing cross-section toward the ends of said arms, whereby increased flexibility of the arms toward the outer ends thereof simulates towing by a boat in open water.

8. The combination according to claim 5, wherein the vertical portion of said catcher nets comprises an open grillwork designed to smooth the surface of the water ahead of novice skiers.

9. Recreational and training apparatus for water skiers comprising:

a plurality of open pie-shaped frame sections, each having radial legs adapted for attachment to radial legs of adjacent frame sections to provide a substantially circular framework,

deck planking members attached to said frame sections to provide a flat deck and spaced from one another to admit water therethrough,

each of said frame sections having flotation means attached to the radially outer portion thereof,

a floating circular housing removably attached to the radially inner portions of each of said pie-shaped frame sections, said housing and said flotation means providing buoyancy to float the framework in a partially submerged condition defining a shallow enclosed body of water over the open deck of said framework,

traction means comprising a vertical shaft extending from said housing and having a plurality of radial arms attached thereto and extending over the water,

motor means disposed in said housing and driving said vertical shaft to rotate said arms, and

a plurality of depending tow handles attached to said radial arms, whereby skiers may be towed by said radial arms over the surface of the water by gripping said tow handles.

10. The combination according to claim 9, including an L-shaped catching net rigidly attached to each of said radial arms substantially in the path of the skier being towed by the preceding arm, and having vertical portions extending into the water almost to said deck planking members and having horizontal portions extending in the direction of rotation of said arms, whereby skiers falling from a preceding arm can be retrieved by said catching nets.

11. The combination according to claim 9 wherein said framework is moored by anchor means allowing a predetermined rotary movement in the water in a direction backward relative to the direction of said towed skiers to give sudden acceleration similar to that of a tow boat as said anchor means suddenly halts the backward rotation of said framework, and to reduce the starting load on said motor means.

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