

March 16, 1971

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3,570,179

SWIMMING TOY ASSEMBLY

Filed May 1, 1969

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FIG-1

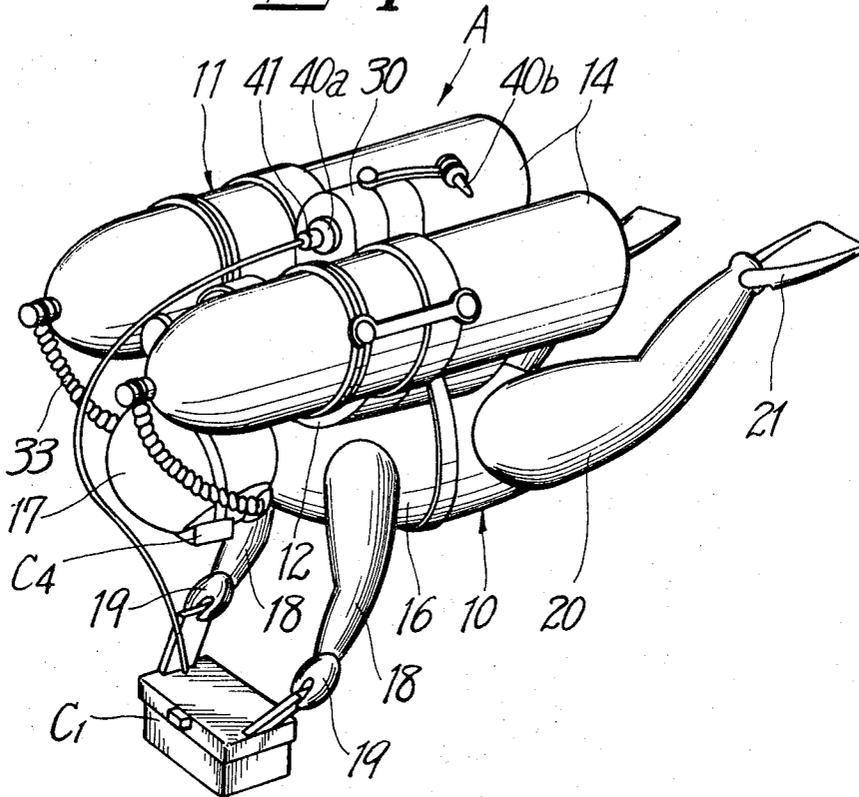
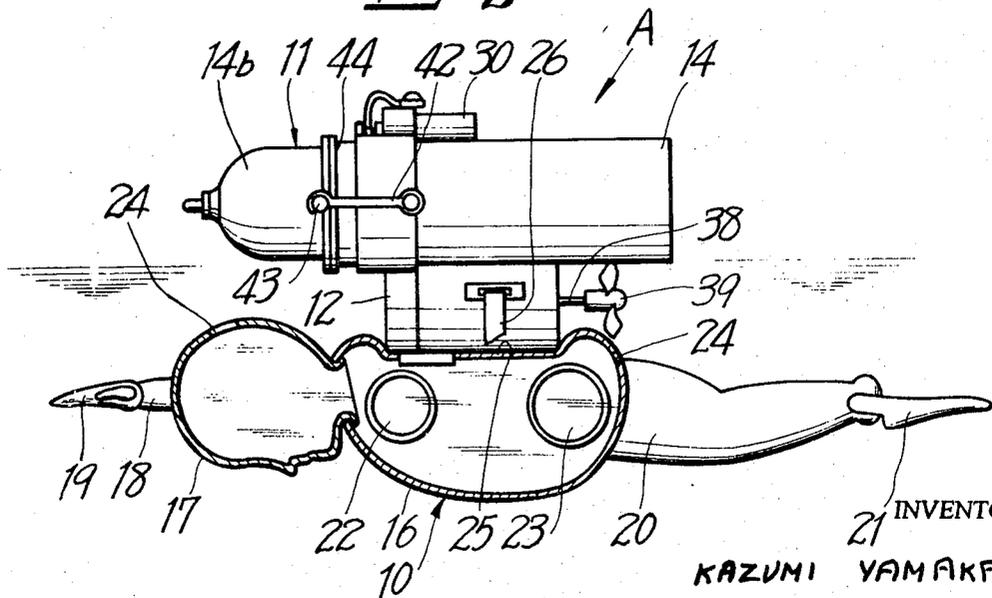


FIG-2



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FIG-3

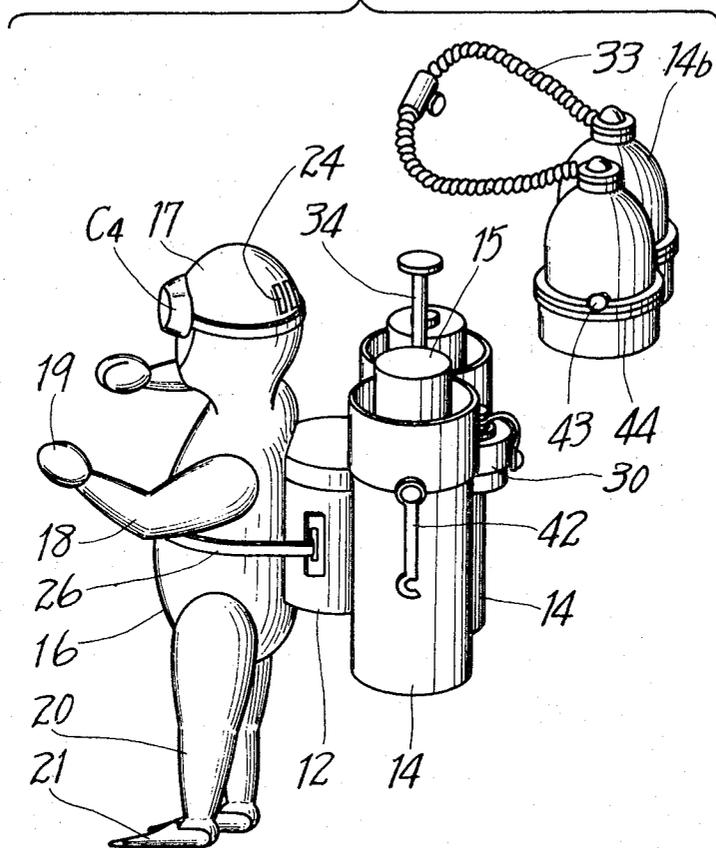


FIG-4

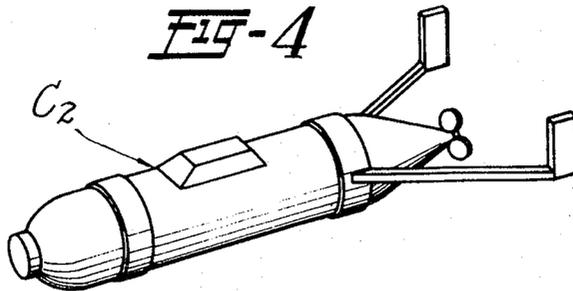
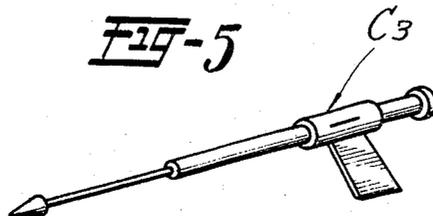


FIG-5



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FIG-6

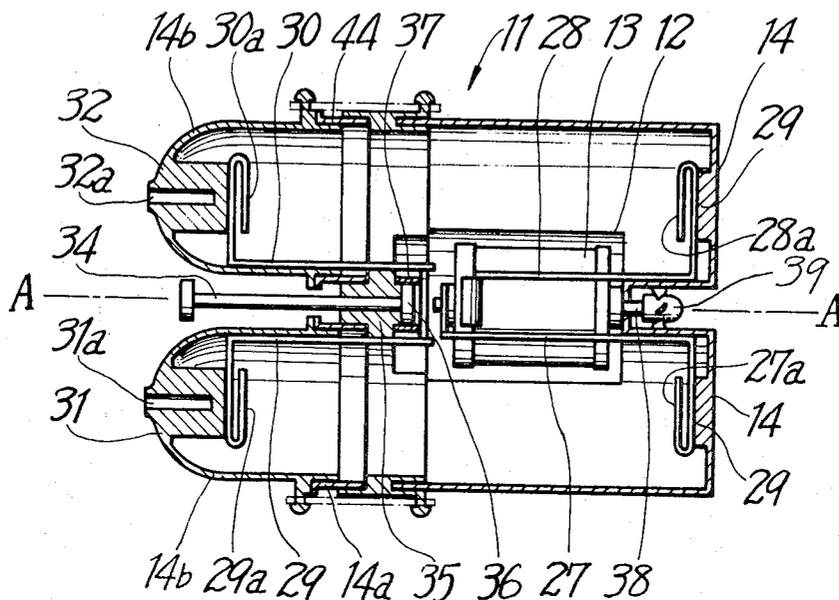
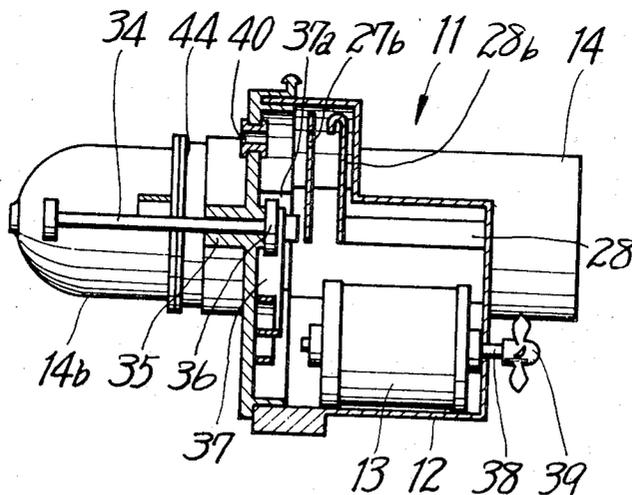


FIG-7



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FIG-8

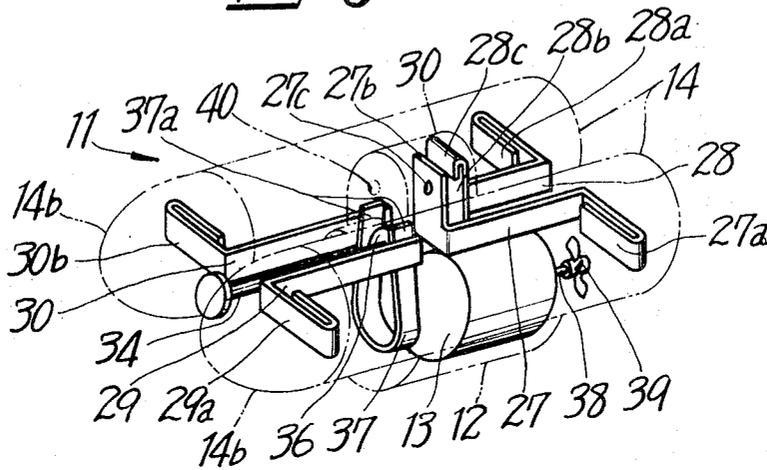
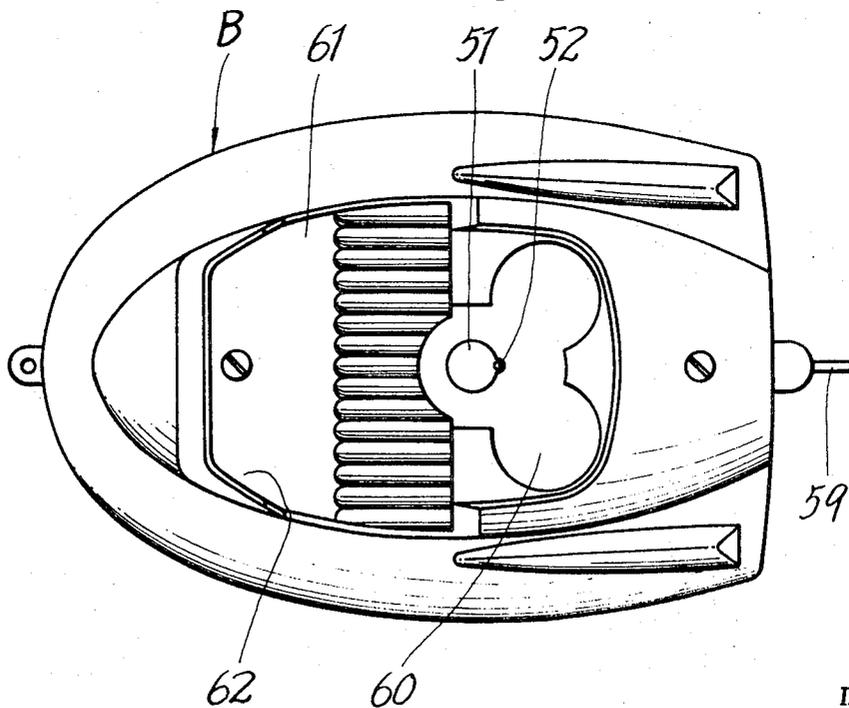


FIG-9



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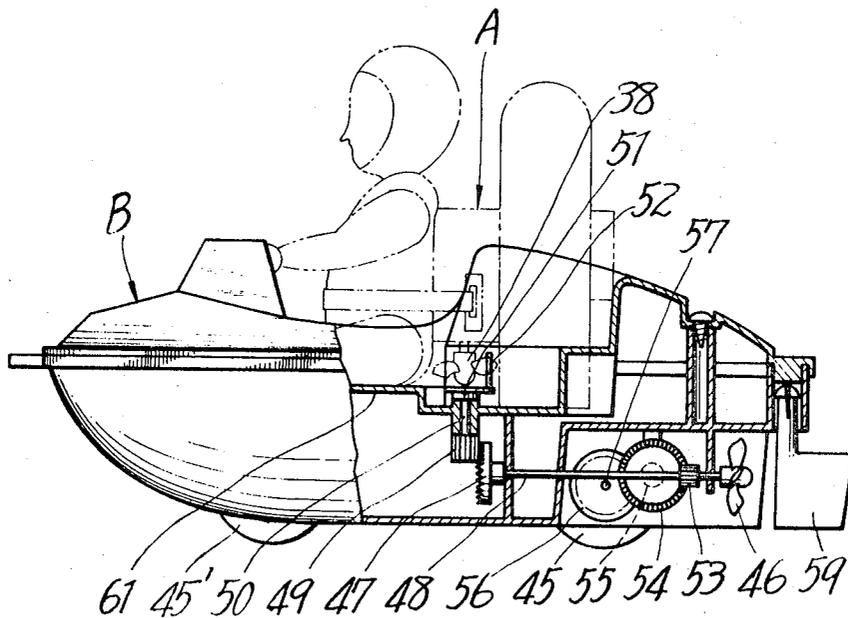
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FIG-10



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SWIMMING TOY ASSEMBLY

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43/41,794

Int. Cl. A63h 33/26

U.S. Cl. 46—243

9 Claims

ABSTRACT OF THE DISCLOSURE

A swimming toy assembly which comprises a swimmer body and a power unit, the power unit being detachably connected to said swimmer body and arranged to drive it through water by a screw propeller. The toy assembly is arranged to be utilized as a driving unit for driving a moving unit, such as an amphibious car, which is arranged to receive the toy assembly and to be driven by it.

SUMMARY OF THE INVENTION

This invention relates to a toy, and more particularly to a novel swimming toy assembly comprising a swimmer body and a power unit combinable with said swimmer body and arranged to drive it. The power unit includes a housing, a battery operated motor disposed within said housing and a screw propeller rotated by said motor for propelling said swimmer body.

It is, therefore, one object of the present invention to provide entertainment and amusement for children by providing a new swimming toy assembly which is capable of swimming by the screw propeller.

It is another object of the present invention to provide a new swimming toy assembly of the kind described above which can be utilized as a driving unit for driving a moving unit, such as a boat, an amphibious car, etc., by providing such moving unit with power transmission means arranged to be engaged with the motor-driven screw propeller of said swimming toy assembly.

It is a further object of the present invention to provide a moving unit, such as a boat, an amphibious car, etc., which is arranged to receive said swimming toy assembly in detachable engagement and to be driven by it.

It is still a further object of the present invention to provide a swimming toy assembly of the kind stated above which is provided with eye-catching detachably connected accessory units.

It is yet another object of the present invention to provide new and useful toys of the character stated above which are simple in construction and operation and which can be produced and sold at a reasonable cost.

Other objects and advantages of the invention will be apparent from the following detailed description and from the accompanying drawings in which:

FIG. 1 is a perspective view of a swimming toy assembly as one embodiment of the present invention, illustrating the state in which the toy is swimming while operating a detachably connected underwater camera;

FIG. 2 is a partly cross-sectioned side view of the toy assembly of FIG. 1, with some accessories taken away;

FIG. 3 is a perspective view of the toy assembly of FIG. 1 from which the underwater camera has been removed, illustrating how the used batteries are replaced with new ones;

FIG. 4 is a perspective view of an accessory unit in the form of a sea tow;

FIG. 5 is a perspective view of another accessory unit in the form of a spear gun;

FIG. 6 is a partly cross-sectioned elevational view of a power unit of the present invention;

FIG. 7 is a longitudinal cross-sectional view of the power unit taken along the line A—A of FIG. 6;

FIG. 8 is a perspective view of the power unit from which a housing has been removed, illustrating the internal structure thereof;

FIG. 9 is a plan view of a moving unit in the form of an amphibious car, combinable with the power unit and arranged to be driven by it, according to the present invention; and

FIG. 10 is a partly cross-sectioned side view of the moving unit shown in FIG. 9, illustrating the internal structure thereof and the state in which the swimming toy assembly is received by said moving unit.

In FIGS. 1 to 10, like portions or parts are designed with like numerals.

Referring now to the drawing in FIG. 1, there is shown a presently preferred form of a swimming toy assembly, generally designated A, according to the present invention. As shown, the swimming toy assembly A comprises a swimmer body 10 in the form of a simulated diver and a power unit 11 having a motor housing 12 within which is disposed an electric motor 13 and a pair of bomb-like housings 14 in each of which is encased a cell battery 15. The swimmer body 10 has the trunk 16, a head 17, arms 18 each having a hand 19 and legs 20 each having a fin 21, all of which may be made of suitable plastics materials. Each arm 18 is rotatably mounted at its base in a portion 22 adjacent each shoulder of the body. Also, each leg 20 is rotatably mounted at its base in each lower side portion 23 of the trunk 16. Each fin 21 is pivotally fixed to the end portion of each leg 20. As shown in FIG. 2, the swimmer body 10 including head 17, arms 18 and legs 20 is of a hollow structure and is provided with a plurality of apertures 24 which permit water to flow into the hollow interior of the body for the purposes which will be described later.

The swimmer body 10 is provided in the back thereof with a recess 25 in which a portion of the motor housing 12 of said power unit is snugly received and which cooperates with an elastic belt 26 attached to the power unit 11 to detachably secure said power unit to said swimmer body. Each of the bomb-like housings 14 which are integral with each other has an upper opening 14a through which a dry cell battery 15 is inserted in the housing 14. A twin caps 14b are provided for closing the upper openings 14a of said bomb-like housings. The hollow interiors of the bomb-like housings 14 communicate with each other and also with the motor housing 12 and a substantially semicylindrical housing 30 integral with said housings.

As shown in FIGS. 6 through 8, a pair of parallel spaced-apart elongated electrical contacts 27, 28 are longitudinally disposed within the cylindrical housings 14. The inner ends of said contacts extend laterally in opposite directions to form U-shaped terminals 27a, 28a, each of which rests on a convex portion 29 of the inner end wall of each housing 14. The other ends of said contacts extend in one lateral direction to form parallel spaced-apart terminals 27b, 28b. These terminals 27b, 28b are positioned in the substantially semi-cylindrical housing 30 which is integrally formed with the cylindrical housings 14 and the motor housing 12 and which projects outwardly from a portion of the unit 11 between the cylindrical housings 14 and on the side, opposite to the motor housing 12, of the unit 11. As clearly shown in FIG. 8, one 27b of these terminals is provided with a circular aperture 27c having a small diameter, and the other 28b is turned toward the former 27b and bent inwardly at its end to form a U-shaped portion 28c.

A pair of parallel spaced-apart elongated electrical contacts 29, 30 are secured to the adjacent inner faces of the cylindrical wall portions of the twin caps 14b. The inner ends of said contacts extend laterally in opposite directions to form U-shaped terminals 29a, 30a which face to the terminals 27a, 28a, respectively. The terminals 29a, 30a of the twin caps 14b rest on the bosses 31, 32 formed on the innermost portions of the caps, respectively. The bosses 31, 32 are provided with longitudinal bores 31a, 32a in which the ends of a simulated air tube 33 as an accessory is inserted.

Indicated by reference numeral 34 is a switch lever which is rotatably fixed to the connection 35 of the cylindrical housings 14. The switch lever 34 has at its inner end a cam member 36 having an oval shape in plan view which is secured to and rotatable with said switch lever and which is adapted to engage a substantially U-shaped resilient contact member 37 the base of which is securely held immediately above the top of the electric motor 13. The contact member 37 is arranged so that both arms 37a of the U are constantly inwardly biased. As is best seen from FIGS. 6 and 8, when the cam member 36 is in inoperative position, that is, when the side edges of the oval cam member 36 are in pressure contact with the arm portions 37a of the U-shaped contact 37, the arm portions 37a are kept disengaged from the lower end portions of the elongated contacts 29 of said twin caps 14b and consequently, the motor circuit is kept broken. On the other hand, when the cam member 36 is moved from the inoperative position by the manual operation of said switch lever 34, the arm portions 37a of the U are spread and brought into contact with the lower end portions of the elongated contacts 29 by the ends of the oval cam member 36, thus completing the motor circuit to actuate the motor 13. As clearly shown in FIGS. 2, 6, 7, 8 and 10, the electric motor 13 is provided with an output shaft 38 which projects downwardly through the bottom wall of the motor housing 12 by way of an appropriate water-tight seal. The output shaft 38 has on its outer end a screw propeller 39 which is rotated by it. This screw propeller 39 is so arranged as to serve as common driving means for driving the swimming toy assembly A and the moving unit B, as will be described later.

The semi-cylindrical housing 30 has in its top wall a circular socket 40 for receiving a jack 41 connected to an electrically operated accessory unit C₁ shaped in the form of an underwater camera. The circular socket 40 is aligned with the circular aperture 27c of the terminal 27b so that the user can easily plug in to operate the accessory unit. When the camera jack 41 is inserted straight into the socket 40, spaced-apart terminals 27b, 28b are brought into contact with each other at 27c and 28c through the jack 41, thus making the electrical circuit between the dry cell 15 and the electrically operated accessory unit C₁. When the accessory unit C₁ is not in use, the socket 40 requires to be closed with the plug 40b swingably attached to the semi-cylindrical housing 30 to keep the unit 11 water-tight. The socket 40 is provided with a cylindrical seal member 40a of elastic material, such as a rubber, so that the water may be completely prevented from flowing into the unit 11 through the socket 40 by inserting either jack 41 or plug 40b in said socket.

Pivotaly mounted on a portion of the outer surface of each of the bomb-like housings 14 is an elongated hook member 42 engageable with a projection 43 protruding outwardly from a portion of each of the twin caps 14b. Each cap 14b is provided with an annular seal member 44 of elastic material, such as a rubber, which is mounted on the outer periphery adjacent the opening of the cap and which is adapted to fit the inner periphery of the counterbored opening 14a of each of the cylindrical housings 14. Accordingly, when the projections 43 are locked by the hook member 42 after the twin caps 14b have been placed in closed position, the openings of the

housings 14 are completely closed by the caps 14b in water-tight condition, thereby preventing the water to flow into the housings through the openings for the protection of the cell batteries 15 and the motor 13.

FIGS. 4 and 5 shows a simulated sea tow C₂ and a simulated spear gun C₃, which are other accessory units of the present invention, respectively. Although the aforementioned underwater camera C₁ has a self contained electrical device, such as a lamp device, not shown, these units C₂, C₃ are not provided with any such device. However, such device may be provided in these units, if desired. The underwater camera C₁ and the sea tow C₂ may be detachably secured to the hands 19 in the manner depicted in FIG. 1, since the hands 19 are made of elastic plastics material so that they can firmly grasp such accessories. Similarly, the spear gun C₃ can be detachably secured to either one of the hands. Detachably mounted on the head 17 is a simulated underwater mask C₄ which is another accessory of the present invention. It goes without saying that different accessory units may be attached to the swimmer toy assembly A other than those units C₁, C₂, C₃ and C₄.

Referring now particularly to FIG. 3, it will be seen that each of the cylindrical casings 14 has a diameter larger than that of the dry cell 15. This is intended to form an annular space between the casing 14 and the cell 15 so that the power unit 11 may be given a certain buoyancy for the purpose of preventing the toy from sinking deep into the water by its weight. Also, it will be seen that replacement of the cell batteries 15 with new ones can be easily done with such simple procedure that the pair of the caps 14b is pulled out of the cylindrical casings 14b after unlatching the hooks 42 on both sides, and then replace the batteries 15 with new ones.

When it is desired to operate the swimmer toy assembly A according to the present invention, firstly, it is preferably submerged to induct an appropriate quantity of water into the hollow interior of the swimmer body 10 through the apertures 24 of the body so as to suitably weight the swimmer with water to balance the swimmer 10 and power unit 11, thereby stabilizing or adjusting the floating position of the toy assembly A. Secondly, the legs 20 and the fins 21 should be straight out behind the trunk 16 so that the toy may smoothly move through water. Finally, the motor 13 is actuated by turning the switch lever 34 to "ON" position and the toy is released and it starts to swim with the screw propeller 39.

The moving unit B shaped in the form of an amphibious car is arranged to receive the swimming toy assembly A in detachable engagement and to be driven by it. In FIGS. 9 and 10, the moving unit B is illustrated as applied to an amphibious car, but it is shown only by way of example and not limited to such a car. In the illustrated embodiment, the amphibious car is provided with wheels 45, 45' for driving the car on a supporting surface, such as a floor and with a screw propeller 46 for driving it on the water. A crown gear 47 is fixedly mounted on a shaft 48 bearing the screw propeller 46 and is arranged to mesh with a pinion 49 fixed to the lower end of a vertical transmission shaft 50 rotatably mounted in a portion of the chassis of the car. The shaft 50 is provided at its top a circular plate 51 which has on its upper surface an upwardly projecting eccentric pin 52. The horizontal shaft 48 has on its intermediate portion a pinion 53 which meshes with a crown gear 54 having a pinion 55 coaxial therewith, which pinion 55, in turn, meshes with a toothed wheel 56 fixedly mounted on a rear axle 57 on which rear wheels 58 are fixedly mounted. Numeral 59 indicates a rudder for steering the car when propelled on the water.

The amphibious car is provided with a recess 60 for receiving the lower ends of the bomb-like casings 14, a seat 61 on which the swimmer 10 can be seated, and with a chamber 62 into which the legs 20 of the swimmer can be inserted. In this arrangement the swimmer toy as-

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sembly A is held in place on the car B. When the toy assembly A is located and held on the amphibious car B in an upright position as shown in FIG. 10, the screw propeller 39 of the power unit 11 is brought into engagement with the vertical eccentric pin 52. Consequently, as the screw propeller 38 is driven by the motor 13, the eccentric pin 52 is rotated by it, causing the vertical shaft 50 to be driven. As the vertical shaft 50 is thus driven, its rotation is imparted to the horizontal shaft 48 through the pinion 49 and the crown gear 47 in mesh therewith, thus causing the screw propeller 46 of the amphibious car and the rear wheels 45 to be simultaneously rotated thereby to propel the car both on the supporting surfaces and the water.

What is claimed is:

1. A toy assembly comprising a hollow swimmer body and a power unit arranged to be kept water-tight and to be detachably secured to said swimmer body, said power unit comprising a first housing, dry cell batteries disposed within said housing, a second housing, an electric motor disposed within said second housing and arranged to be operated by said dry cell batteries, said power unit having a space for imparting buoyancy thereto in water, said hollow swimmer body having a plurality of apertures for inducting water thereinto to thereby weight said swimmer body to keep the balance of said toy assembly in water, and propelling means arranged in operative connection with said motor for operation thereby to propel said toy assembly through water.

2. A toy assembly, as set forth in claim 1, wherein said propelling means for propelling said toy assembly comprises a first shaft mounted in and arranged to be driven by said motor, and screw propeller means mounted on one end of said first shaft and arranged to be driven by said first shaft.

3. A toy assembly, as set forth in claim 1, wherein socket means is provided in said power unit and is arranged in electrical connection with said batteries.

4. A toy assembly, as set forth in claim 3, comprising an electrically operated accessory member, a jack connected to said accessory member and arranged to be inserted into said socket means for operation by said cell batteries, and said accessory member arranged to be mounted on said hollow swimmer body.

5. A toy assembly, as set forth in claim 1, wherein said hollow swimmer body comprises a head, arms and legs, said arms and legs being rotatably secured to said body, each of said arms having an elastic hand, each of said legs having a fin rotatably secured thereto.

6. A toy assembly, as set forth in claim 5, comprising an accessory member arranged to be held by the hand.

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7. A toy assembly comprising a moving unit and a simulated diver carrying a power unit and removably positioned on said moving unit with said power unit, said power unit comprising a first housing, dry cell batteries disposed within said housing, a second housing, an electric motor disposed within said second housing and arranged to be operated by said dry cell batteries, and first propelling means operatively connected to said motor for operation thereby to propel said simulated diver through water, said first propelling means including a first shaft mounted in and arranged to be driven by said motor, said first shaft having on one end thereof a first screw propeller arranged to be rotated with said first shaft, said moving unit comprising a third housing, second propelling means for propelling said moving unit positioned within said third housing, said second propelling means including transmission means arranged to be engaged with said first screw propeller and adapted to be rotated by it when the power unit carried by said simulated diver is positioned on said moving unit, and a second shaft arranged to be rotated by said transmission means, and a second screw propeller mounted on and arranged to be rotated with said second shaft, whereby said moving unit is arranged to be propelled on water.

8. A toy assembly, as set forth in claim 7, wherein said second propelling means further comprises an axle and a pair of wheels mounted on said axle, said wheels being arranged in operative connection with said transmission means for operation thereby to propel said moving unit on a supporting surface.

9. A toy assembly, as set forth in claim 7, wherein said transmission means comprises a vertical shaft rotatable about a vertical axis, a crank pin mounted on the top of said vertical shaft and exposed to view, and a pinion mounted on the lower portion of said vertical shaft and in driving engagement with said second shaft.

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U.S. Cl. X.R.

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