This invention relates to a surface and sub-surface mechanical power propulsion device for a human being and has for an object to provide a mechanically powered propulsion device which may be both carried and worn by a human being, being sufficiently light in weight, approximately forty pounds more or less, to be carried by the human being while walking on the beach or in shallow water, and sufficient buoyancy to float on the water and support a human being of at least 150 pounds or more, and to propel the human being through the water at speeds ranging up to the maximum speed that can be endured by a human being when so propelled through the water.

A further object of this invention is to provide a propulsion device for a human being that relies on mechanical power for providing the propulsion instead of relying on human power as in ordinary swimming or in using propulsion devices having hand or foot powered propellers, paddles or flaps.

A further object of this invention is to provide a mechanical power propulsion device which may be used both on the surface of the water and under the surface of the water by merely guiding the device downwardly by proper manipulation of the wearers' hands and feet, and which may have its buoyancy controlled so that the wearer may remain under water with the power turned off, and then may thereafter reascend to the surface by restoring the buoyancy.

A further object of this invention is to provide a mechanical power propulsion device which may be operated by an electric motor powered by suitable light weight storage batteries or other batteries, and may be likewise powered by compressed air motors or other types of small motors with suitable power supply carried within the device.

Still a further object of this invention is to provide a mechanical power propulsion device wherein the wearer has his hands free for any desired manipulations, yet wherein he is also safe from any possible injury from the propelling means, and wherein he does not have to use his hands to hold the device in operative position on his body.

Still a further object of this invention is to provide a surface and sub-surface mechanical power propulsion device highly useful in the military service by underwater demolition squads preliminary to amphibious landings on an enemy held beach, and wherein the wearer may have this propulsion device attached on his front side leaving his back side free for carrying any necessary supplies or other equipment including an oxygen supply for an underwater lung so that he may remain under the water for extended periods of time, and due to the lesser physical exertion necessary in remaining under water than when human power is relied on for propulsion, the same quantity of oxygen supply will last a great deal longer.

Still a further object of this invention is to provide a mechanical power propulsion device which may be streamlined so as to increase the operating efficiency of the propulsion means and thus permit a greater distance to be covered with the same amount of power in the power source.

Still a further object of this invention is to provide a mechanical power propulsion device which may include a built in headlight readily controllable by the wearer particularly for underwater use.

Still a further object of this invention is to provide a mechanical power propulsion device having its power means and control means therefore all suitably water-proofed for surface and sub-surface use.

Still a further object of this invention is to provide a mechanical power propulsion device having a civilian use as for swimming and sport in addition to the military use as set forth above.

Still a further object of this invention is to provide a mechanical power propulsion device for a human being wherein a propulsion motor and propeller are supported within a propeller tube to which is secured a pair of pontoons whose buoyancy is controllable so that the wearer is absolutely safe from possibility of injury from the propeller and may propel himself on or under the water and then reascend to the water and may repeat his descent into the water within the limits of the capacity of a gas compression chamber carried within the propulsion device for restoring the buoyancy thereof.

With the foregoing and other objects in view, this invention comprises the combination, construction and arrangement of parts hereinafter set forth, claimed and disclosed in the accompanying drawings, wherein:

Fig. 1 is a perspective view of the propulsion device of this invention.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is an elevational view looking at the front end of the propulsion device of this invention.

Fig. 4 is a side elevational view.

Fig. 5 is a schematic wiring diagram.

Fig. 6 is a front elevational view of the device being carried by a human being in operative position.

Fig. 7 is a back plan view of a human being with the device in operative position in the water.

Fig. 8 is a side elevational view of Fig. 7.

There is shown at 10 the mechanical power propulsion device of this invention which is arranged to be secured across the chest and waist or across the back of a human being so that it may propel him along the surface of the water or under the surface of the water utilizing mechanical power instead of his own power to provide the propulsion, yet leaving the limbs of the swimmer free for any desired manipulations. The mechanical propulsion device 10 of this invention comprises a chassis 11 preferrably streamlined as shown so as to reduce power loss and increase the efficiency, thus enabling the same power supply to propel the human being for a longer distance and a greater period of time.

The chassis 11 consists of a pair of spaced apart compartmented pontoons 12 and 13 extending parallelly in parallel relation and provided with a longitudinally extending propeller tube 14.

Within the propeller tube 14 there is supported an egg-shaped or streamlined motor housing 15 having its maximum diameter substantially less than the internal diameter of the propeller tube 14. Extending from the motor within the housing 15 is a propeller shaft 16 and a propeller 17, the diameter of the propeller 17 being less than the internal diameter of the propeller tube 14. As shown, the motor within the housing 15 is an electric power motor, but any other type of power motor may be utilized therewithin as may be desired within the limits of the space available. The housing 15 is supported in tube 14 between pontoons 12 and 13 by means of streamlined...
hollow spider supporting arms 18 through which extends a conductor 20 leading to a power source 21 in one of the compartments of one of the pontoons. Both pontoons are substantially identical, and hence, the description of one pontoon applies equally to the other pontoon unless otherwise noted.

When the motor in housing 15 is an electric motor, the power means or power source 21 would be a series of light weight storage batteries, suitable light weight storage batteries being available on the commercial market under the name "Silvercell," but suitable light weight storage batteries of any make may obviously be used. The power source means 21 is located within a compartment formed by a compartment wall 22 and 23, and the top of the chassis is provided with a suitable access panel 24 providing a closure means suitably secured and sealed thereto so as to be water tight when closed.

Extending from the housing 15 and through one of the supporting arms 18 and through one pontoon 12 is a flexible cable 25 which may terminate either at the side of the device or may extend sufficiently so that it may be detachably secured to the arm 26 of the human being 27 using the propulsion device, the cable 25 being securable by a strap 28 carrying a control or switch or relay switch block 30 provided with three control buttons 31, one button being for the off position, one button being for low speed position, and one button being for high speed position. Control block 30 would thus be supported on the heel of one hand so that the button(s) can be operated either by the same hand or by the other hand of the wearer. A buoyancy control compartment 32 is provided in each pontoon by means of a longitudinally extending wall 33, while an electronic or other type of compartment 34 is thereby provided on the other side of the wall 33. A manually controllable gas escape valve 35 is provided adjacent the forward upper portion of each compartment 32, and a water entry and escape valve 36 extends through the bottom of the compartment 32. A gas pressure chamber 37 is provided in the compartment 32 between the wall 22 and the side of the pontoon, and has a control valve 38 extending externally of the pontoon through a suitable water tight fitting. A sealed beam headlight 40 may be provided at the forward end of each pontoon 12 and 13 and has an operating switch 41 conveniently near it for connecting to ground through the chassis and to a battery cell 21 by way of an electric conductor 42 extending along compartment wall 33.

Secured along the outer opposite longitudinal edges of the chassis 11 are three strap receiving eyes 43, 44, and 45. The eyes 43 at the front are to receive a strap 49 which is wound over the back of the wearer so as to support the device in carrying position when the wearer is standing upright or walking on the beach as shown in Fig. 6. A pair of straps 46 are provided with suitable length adjustment means 47 and fastening buckles 48 so that they may secure the device across either the front or the back of the wearer. As shown, the strap 46 extends from the forward eye 44 across the back of the wearer down under the thigh between the legs and over his hip to the diagonally opposed strap receiving eye 45 thus firmly securing the device to the wearer so that he will be pulled along when the power is on.

In Fig. 5, there is shown a diagramatic circle for an electric motor within housing 15 with the throttle or control switch in the neutral position with the power off. Placing the left hand position as shown in the diagram will place both batteries 21 in parallel so that if both batteries are six volt batteries, for instance, a six volt charge will operate the motor within the housing 15. On the other hand, placing switch 31 in the right hand position as seen in the diagram in Fig. 5 will place two batteries 21 in series so that if the batteries 21 are six volt batteries, a 12 volt charge will operate the motor in the housing 15. Obviously, instead of using six volt batteries, 12 volt batteries may be used, if desired, with an electric motor of suitable power.

Access may be had to both compartments 32 and 34 by removing the sealed water tight panel 50 and thereupon replacing it in water tight sealed condition. The compartment 34 may be utilized for suitable electronic or electrical or measuring equipment, as desired, including radar or the like. Obviously, compartment suitable to the particular project may be placed within the compartment 34. While the closure panel 50 has been described as being sealed thereto, it is obvious that a separate closure means for the compartment 34 may be provided so that other compartments may be used for carrying supplies which the wearer will utilize while wearing or swimming with the aid of this mechanical power propulsion device.

An essential feature of the invention is that it enables the human being wearing the device to travel on the surface of the water or under the surface of the water and to remain under the surface of the water, when desired, by suitable manipulation of the air escape valve 35, the water discharge and entry valve 36 and the pressure control valve 38 for blowing out the water in compartment 36 when the person wearing the same desires to reascend to the surface. It will be noted that it eliminates the need for any human power in swimming and relies entirely on mechanical power, leaving the arms and legs of the wearer free for any desired manipulation. With batteries as thus disclosed and described, it is possible to travel continuously for six hours at a slow speed of one-half mile per hour, or for one and one-half hours at a high speed of approximately one and one-half miles per hour, but the high speed may be varied as desired within limitations of the human body to withstand such high speed on the surface of the water or under the surface of the water.

This invention is particularly useful in the military service with underwater demolition soldiers, who with the aid of this device, and wearing suitable conventional oxygen breathing apparatus may investigate enemy beaches and underwater defense obstructions without being visible by the enemy on the shore. Obviously, it may also be used for sport as well as for swimming, for the device with its buoyancy compartment free of water will comfortably support a man of 150 to 200 pounds, depending on the size of the buoyancy compartment, which may be varied as desired. The upper surface 51 of the chassis 11 is preferably contoured or curved slightly as shown in Fig. 3 to fit comfortably across the front of the chest and waist of the wearer, and will likewise fit comfortably across the back of the wearer. This is behind the eyes of the wearer, and will fit comfortably across the back of the wearer. This is behind the eyes of the wearer, and will fit comfortably across the back of the wearer.

The wearer uses his hands and legs for guiding himself through the water, but relies entirely on the mechanical power propulsion device for propelling himself through the water. With the aid of this device, the person wearing the same may remain under water a much longer period of time with the same supply of oxygen due to the fact that he does not have to exert himself to propel himself through the water and thus consumes less oxygen during a given period of time while under water. The swimmer using this propulsion device thus relies entirely on mechanical power for propelling himself through the water instead of human power, and utilizes human power for guiding himself and for operating the controls to vary the speed or cut off the power, thus having his limbs free at all times for any necessary manipulation.

It is thus much more easily possible for the wearer to scout and to attack enemy under water defenses than is possible when he must rely on human power for propulsion.

While the device has been shown and the structure described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction.
may be made therein within the scope of what is claimed, without departing from the spirit of this invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A water surface and sub-surface mechanical power propulsion device for a human being comprising a buoyant chassis, means for securing said buoyant chassis to the torso of the human being in operating position consisting of strap means and strap securing means on said chassis, said strap means being arranged to extend across the torso whereby the limbs are free of restraint, said chassis comprising a housing including hollow compartmented pontoon means adapted to contain gas consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of said chassis and secured between said pontoons, the torso-contacting side of said chassis being substantially continuous and contoured to fit against the torso, propelling means and means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and a power motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, power means for said power motor in said pontoon means, manually operable motor control means on said chassis, a gas release valve in an upper location on said pontoon means, and manual or automatic release of gas from said chassis.

2. A water surface and sub-surface mechanical power propulsion device for a human being comprising a controllably buoyant chassis, means for securing said buoyant chassis to the torso of the human being in operating position consisting of strap means and strap securing means on said chassis, said strap means being arranged to extend across the torso whereby the limbs are free of restraint, said chassis comprising a streamlined housing including hollow compartmented pontoon means adapted to contain gas consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of said chassis and secured between said pontoons, the torso-contacting side of said chassis being substantially continuous and contoured to fit against the torso, the depth of said tube being substantially greater than the depth of said pontoons, propelling means and spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and a power motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, power supply means for said power motor in said pontoon means, power supply conducting means extending from said power supply means to said power motor through said hollow spider arm means, and manual or automatic motor control means on said chassis, whereby the human being may power propell himself through the water.

3. A water surface and sub-surface mechanical power propulsion device for a human being comprising a controllably buoyant chassis, means for securing said buoyant chassis to the torso of the human being in operating position consisting of strap means and strap securing means on said chassis, said strap means being arranged to extend across the torso whereby the limbs are free of restraint said chassis comprising a streamlined housing including hollow compartmented pontoon means adapted to contain gas consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of said chassis and secured between said pontoons, the torso-contacting side of said chassis being substantially continuous and contoured to fit against the torso, the depth of said tube being substantially greater than the depth of said pontoons, propelling means and spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and a power motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, power supply means for said power motor in said pontoon means, power supply conducting means extending from said power supply means to said power motor through said hollow spider arm means, and manually operable motor control means on said chassis, whereby the human being may power propell himself through the water.

4. A mechanical power propulsion device for propelling a human being through water comprising a chassis, means for securing said chassis to the body of the human being in operating position consisting of strap securing means on said chassis at forward and rearward opposite locations and torso attaching straps arranged to extend from said strap securing means across the torso whereby the limbs are free of restraint, said chassis comprising a housing including pontoon means consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of the chassis and secured between said pontoons, propelling means and hollow spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and a power motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, power supply means for said power motor in said pontoon means, power supply conducting means extending from said power supply means to said power motor through said hollow spider arm means, and manually operable motor control means on said chassis, whereby the human being may power propell himself through the water.

5. A mechanical power propulsion device for propelling a human being through water comprising a chassis, means for securing said chassis to the torso of the human being in operating position consisting of strap securing means on said chassis at forward and rearward opposite locations and torso attaching straps arranged to extend from said strap securing means across the torso whereby the limbs are free of restraint, said chassis comprising a housing including pontoon means consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of the chassis and secured between said pontoons, the torso-contacting side of said chassis being substantially continuous and contoured to fit against the torso, the depth of said tube being substantially greater than the depth of said pontoons, propelling means and spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and a power motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, power supply means for said power motor in said pontoon means, power supply conducting means extending from said power supply means to said power motor through said hollow spider arm means, and manually operable motor control means on said chassis, whereby the human being may power propell himself through the water.

6. A water surface and sub-surface mechanical power propulsion device for a human being comprising a con-
trollably buoyant chassis, means for securing said buoyant chassis to the torso of the human being in operating position consisting of strap securing means on said chassis at forward and rearward opposite locations, a pair of torso attaching straps, each arranged to extend from a forwardly located strap securing means on one side of the chassis, diagonally across the body and about the thigh to a rearwardly located strap securing means, said rearwardly located strap securing means for each strap being diagonally opposite its forwardly located strap securing means whereby the limbs of a propulsion device carrying strap extending from a forward location on the chassis to extend about the neck of the human being, said chassis comprising a housing including hollow compartmented pontoon means adapted to contain gas consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of said chassis and secured between said pontoons, propelling means and hollow spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and a motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, battery power means for said electric motor in said pontoon means, power conducting means extending from said battery power means to said electric power motor through said hollow spider arm means, and manually operable motor control means on said chassis connected to said motor, whereby the human being may power propel himself through the water.

9. A water surface and sub-surface propulsion mechanical power device for a human being comprising a controllably buoyant chassis, means for securing said buoyant chassis to the torso of the human being in operating position consisting of strap securing means on said chassis at forward and rearward opposite locations, a pair of torso attaching straps, each arranged to extend from a forwardly located strap securing means on one side of the chassis, diagonally across the body and about the thigh to a rearwardly located strap securing means, said rearwardly located strap securing means for each strap being diagonally opposite its forwardly located strap securing means whereby the limbs are free of restraint, a propulsion device carrying strap extending from a forward location on the chassis to extend about the neck of the human being, said chassis comprising a housing including hollow compartmented pontoon means adapted to contain gas consisting of a pair of spaced apart compartmented pontoons and a propeller tube extending longitudinally of said chassis and secured between said pontoons, the torso contacting side of said chassis being substantially continuous and contoured to fit against the torso, propelling means and hollow spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and an electric motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, battery power means for said electric motor in each of said pontoons, power conducting means extending from said battery means to said motor power through said hollow spider arm means, manually operable motor control means on said chassis, a gas release valve in an upper location on each said pontoons, a water entry and escape valve in a lower location on each said pontoons, a gas pressure chamber, means connecting said gas pressure chamber to a gas compartmented pontoon means and a gas releasing gas from said chamber to said pontoon means, whereby the human being may power propel himself on the surface with said pontoon means in buoyant condition, may manipulate said valves to vary the buoyancy between positive and negative and may power propel himself under the surface.

A mechanical power propulsion device for propelling a human being through water comprising a chassis, means for securing said chassis to the torso of the human being in operating position consisting of strap securing means on said chassis at forward and rearward opposite locations and torso attaching strap means arranged to extend from said strap securing means across the torso whereby the limbs are free of restraint, said chassis comprising a housing including pontoon means consisting of a pair of spaced apart compartmented pontoons and a propeller tube extending longitudinally of the chassis and secured between said pontoons, the torso contacting side of said chassis being substantially continuous and contoured to fit against the torso, propelling means and hollow spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and an electric motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, battery power means for said electric motor in each of said pontoons, power conducting means extending from said battery means to said motor power through said hollow spider arm means, and manually operable motor control means on said chassis, whereby the human being may power propel himself through the water.

10. A mechanical power propulsion device for propelling a human being through water comprising a chassis, means for securing said chassis to the torso of the human being in operating position, said chassis comprising a housing including pontoon means consisting of a pair of spaced apart pontoons and a propeller tube extending longitudinally of the chassis and secured between said pontoons, the torso contacting side of said chassis being substantially continuous and contoured to fit against the torso, the depth of said tube being substantially greater than the depth of said pontoon means, propelling means and hollow spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and an electric motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, battery power means for said electric motor in said pontoon means, power conducting means extending from said battery power means to said electric power motor through said hollow spider arm means, and manually operable motor control means on said chassis connected to said motor, whereby the human being may power propel himself through the water.

11. A water surface and sub-surface propulsion mechanical power device for a human being comprising a controllably buoyant chassis, means for securing said buoyant chassis to the torso of the human being in operating position consisting of strap securing means on said chassis at forward and rearward opposite locations, a pair of torso attaching straps, each arranged to extend from a forwardly located strap securing means on one side of the chassis, diagonally across the body and about the thigh to a rearwardly located strap securing means, said rearwardly located strap securing means for each strap being diagonally opposite its forwardly located strap securing means whereby the limbs are free of restraint, a propulsion device carrying strap extending from a forward location on the chassis to extend about the neck of the human being, said chassis comprising a housing including hollow compartmented pontoon means adapted to contain gas consisting of a pair of spaced apart compartmented pontoons and a propeller tube extending longitudinally of said chassis and secured between said pontoons, the torso contacting side of said chassis being substantially continuous and contoured to fit against the torso, propelling means and hollow spider arm means supporting said propelling means within said propeller tube, said propelling means comprising a propeller and an electric motor, a waterproof housing about said motor having a maximum transverse dimension substantially less than that of said tube, battery power means for said electric motor in each of said pontoons, power conducting means extending from said battery means to said motor power through said hollow spider arm means, manually operable motor control means on said chassis, a gas release valve in an upper location on each said pontoons, a water entry and escape valve in a lower location on each said pontoons, a gas pressure chamber, means connecting said gas pressure chamber to a gas compartmented pontoon means and a gas releasing gas from said chamber to said pontoon means, whereby the human being may power propel himself on the surface with said pontoon means in buoyant condition, may manipulate said valves to vary the buoyancy between positive and negative and may power propel himself under the surface, and may restore the buoyancy to a neutral state.
said electric power motor through said hollow spider arm means, manually operable motor control means on said chassis connected to said motor, a gas release valve in an upper location on said pontoon means, a water entry and escape valve in a lower location on said pontoon means, a gas pressure chamber, means connecting said gas pressure chamber to said pontoon means, and a readily accessible control valve connected to said pressure chamber for releasing gas from said chamber to said pontoon means, whereby the human being may power propel himself on the surface with said pontoon means in buoyant condition, may manipulate said valves to vary the buoyancy between positive and negative and may power propel himself under the surface, and may restore the buoyancy to reascend to the surface.

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