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APPLICATION FILED MAR. 19, 1917.

1,378,641. Patented May 17, 1921.

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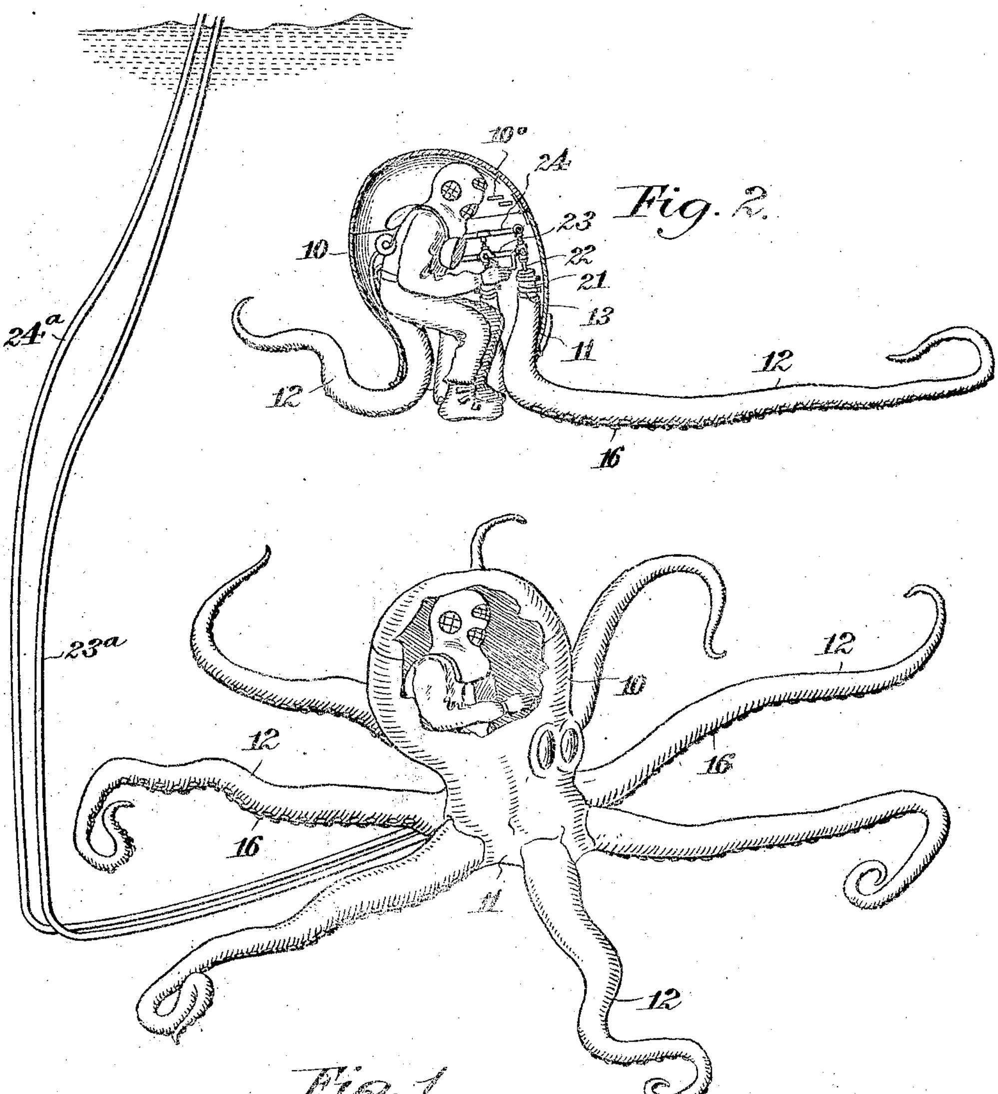

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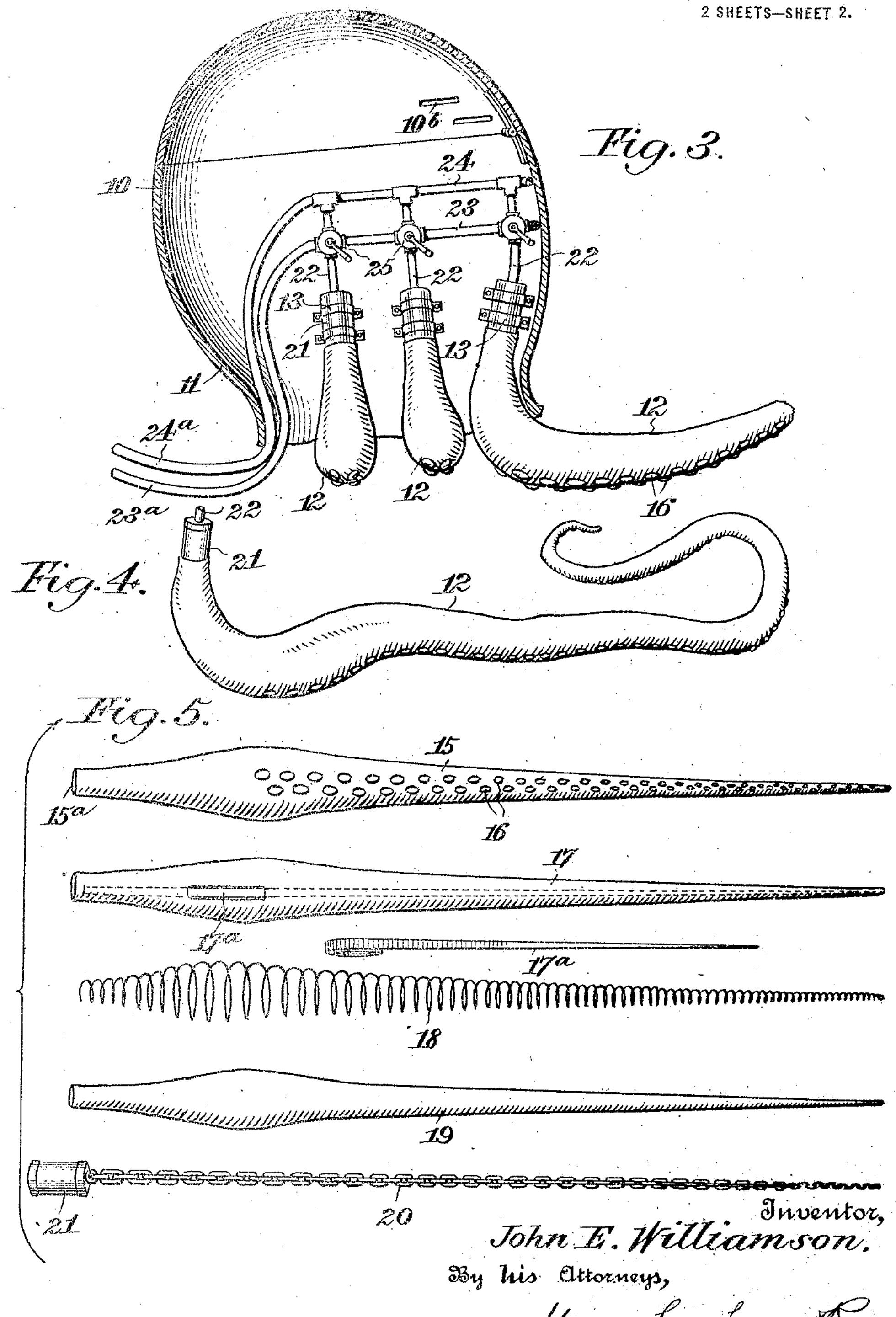

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UNITED STATES PATENT OFFICE.

JOHN ERNEST WILLIAMSON, OF NORFOLK, VIRGINIA.

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To all whom it may concern:

Be it known that I, JOHN ERNEST WILLIAMSON, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in the Art of Producing Lifelike Simulations to Inanimate Objects, of which the following is a specification.

This invention relates to apparatus for producing life-like simulations to inanimate objects, and more particularly to apparatus designed to simulate the movements of under-water creatures.

Movements of many of the under water creatures are sinuous or squirming in character—as for instance, the movements of an eel—while others have members—such for instance, as tentacles—which have movements of this type although the creature itself may be stationary. For instance, creatures of the mollusk type, such as the octopus, the squid, etc., illustrate the latter type.

The present invention is designed for the purpose of more or less accurately simulating the motions of these creatures, and, where the apparatus is employed for theatrical or other purposes, may serve as an illusion-creating structure. For instance, the general principles of the invention may be employed in producing an apparatus having the appearance of a sea-serpent, so that by locating the apparatus at a suitable point where close inspection can be prevented and the apparatus be operated to give movements which appear life-like, the illusion can not well be detected. Or the apparatus may be in the form of an octopus with its several tentacles, the latter being given movements simulating the movements which the tentacles have in the creature itself.

The apparatus is preferably operated wholly or partially under water so as to increase the effect of the illusion and also render it possible to provide simulations of creatures heretofore immune from simulation by reason of the peculiar motions of the creatures and their under-water habitat.

To these and other ends, therefore, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construtcion and combination of parts and the methods of providing the simulation, hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the drawings, in which similar reference characters indicate similar parts in each of the views:—

Figure 1 is a perspective view, somewhat diagrammatic in form showing the apparatus in the form of an octopus or devil fish, a portion of the shell being broken away to illustrate the operator in position.

Fig. 2 is a view partly in section and partly in elevation showing the interior of the head and body, with the operator in position.

Fig. 3 is an enlarged fragmentary sectional view of the head and body showing operating connections therein.

Fig. 4 is a detail view of one of the tentacles.

Fig. 5 is a composite view showing the several parts which are employed in producing one form of tentacle.

For the purpose of illustrating the general principles of the invention I have shown the apparatus as in the form of an octopus having a head and body and a plurality of tentacles, these parts preferably having the general contour and appearance of the creature itself. Obviously, the general idea disclosed herein can be employed in simulating other creatures, and it is to be understood that the invention is not limited to any particular type of object being simulated. As heretofore pointed out, it is preferred to employ the apparatus in simulation of under-water creatures, but the invention is not to be considered as limited in this respect.

The head 10 and body 11 are preferably in the form of a shell molded or otherwise formed to simulate these parts of the octopus. The shell is preferably formed with an open bottom through which the tentacle and certain operating elements are led.

The shell is adapted to receive the operator, the head preferably being formed with a hinged portion which can be raised to permit the entrance of the operator. As the apparatus is designed to be operated under-water, the operator preferably wears a diver's suit, and, for the purpose of increasing the illusion, the suit is preferably of the self-contained type, a well-known structure, thus eliminating the necessity of hiding the escape of air bubbles from the head of the octopus, a result which would be present where the breathing air for the operator is dilevered through suitable connections. Since the shell is formed with an open bottom, there is no material pocketing of air within the shell, thus practically eliminating any buoyancy of the shell, permitting it to retain its position without the necessity of employing a heavy weight.

As shown in Figs. 2 and 3, the shell carries a plurality of independent members or casings which have the contour and appearance of tentacles, each tentacle, indicated at 12, being secured to the shell at its inner end by suitable means such as straps 13 secured to the shell.

The tentacles extend outward through the bottom of the shell and have any desired length.

The illusion effect is mainly produced by the sinuous and squirming movements of the tentacles and more particularly the outer end portions thereof. These movements are in no particular cycle or direction, and hence the illusion becomes more perfect, since they appear to be apparently free from mechanical source. As the movements are provided under water the illusion is increased as a mechanical structure would apparently be affected by buoyancy conditions, and no means of compensation are seen.

Each tentacle is built up in the form of a composite structure designed to provide the various movements, the structure being shown more particularly in Figs. 4 and 5, in which the visual portion is provided by an outer cover 15 formed of light canvas or the like, the cover having an open end 15^a and having the general contour of the tentacle. To increase the effect of the illusion, the cover may have secured thereto suitable cup-shaped members 16 which may be formed in a simple manner by the use of the ordinary rubber ball cut in half, these members being an imitation of the suckers of the tentacle. Cover 15 is adapted to internally receive in nested relation a second cover 17 also preferably of canvas, this cover being provided with a pocket extending approximately throughout the length of the cover and which is adapted to receive a tapered spring 17^a, the tapering effect being toward the advance end of the spring, thus tending to vary the resistance of the spring, the advance end of the spring offering the least resistance. The spring may be considered as a constant pressure producing structure and tends to retain the free end of the tentacles curved inwardly to a greater or less extent.

Mounted within the cover 17 is a spiral spring structure 18 which provides a light form or shape for retaining the covers expanded cross sectionally. Being in the form of a coil, however, the spring permits comparatively free movements of the free end of the tentacle as presently described.

Positioned within spring 18 is a rubber tube, bag or sack 19 having its advance end imperforate and being formed at its opposite end with an opening. Within tube 19 is mounted a chain structure or flexible member 20, the links of which gradually decrease in size and weight toward the advance end, the opposite end of the chain being in the form of a plug 21 about which parts 19, 17 and 15 are secured, thus closing the inner end of the tentacle. The plug is preferably formed with a suitable passageway with which a pipe connection 22 is in open communication, as shown in Figs. 3 and 4, said connection leading to a pair of pipe connections 23 and 24 located within the shell, a suitable valve structure 25 being provided to control communication between pipes 23 and 24 and the individual connection, it being understood that each tentacle is provided with such connection with pipes 23 and 24.

One of said pipes (preferably pipe 23) forms what may be termed a feed pipe, said pipe having an operative connection with a suitable source of air supply under pressure, the connection being preferably a flexible one as at 23^a and leading outward from the shell through the open bottom, extending to the source which may be in the form of mechanism carried by a boat or punt on the surface of the water within which the octopus is being exhibited. Pipe 24 forms the exhaust, and is similarly connected, this pipe being extended to the surface and, if desired, to an exhaust mechanism, through a connection 24^a. The exhaust structure is preferably employed in order that the air which may be let out of a tentacle will not escape within the shell or outside of the shell and thus form bubbles; the connections lead this air to the water surface. Where the structure is designed to produce an illusion, connections 23^a and 24^a may be placed out of the view in suitable manner as by burying these connections in the sand for a sufficient distance to retain the ascending portions out of view.

As will be seen, each tentacle is thus made up of instrumentalities each of which is designed to produce its effect in tentacle manipulations. Spring 18 maintains the canvas covers expanded cross sectionally—preserving the cross-sectional contour—and yet permits of substantial freedom of movement of the tentacle under the action of the pressures in the casing. Tube 19 forms a collapsible air chamber which, by reason of its shape will cause movements of the tentacle against the resistance of spring 17^a, when air is introduced into the tube, the amount of movement being dependent to a more or less extent upon the amount of air which is introduced. Bag or sack 19, being within the casing moves with the latter under the action of spring 17ᵃ. Introduction of air into the bag or sack tends to cause the latter to straighten out and thus produces a pressure opposing the pressure of spring 17ᵃ. By varying the pressure and amount of air in the bag or sack, the difference in value of the two pressures can be varied and thus control the movements of the tentacle to a more or less extent. Chain 20 serves to counteract the effect of buoyancy when tube 19 is inflated.

As will be seen, the particular formation of these elements is such that changes in position of the free end of the tentacle are compensated to a more or less degree by the particular arrangement of the parts. For instance, the free end of the tentacle has considerably greater flexibility than the intermediate portion, the decrease of resistance toward the outer end of spring 17ᵃ, due to the taper formation, is more or less compensated by the decreased cross sectional area of tube 19 toward such free end and a corresponding decrease in the size and weight of the chain links which affect the buoyancy. As a result, control of the introduction of air into tube 19 enables the movements of the free end of the tentacle to be partially controlled especially as to extent of movement. This increase in flexibility also is of advantage by reason of the fact that the movements are made against the resistance of the water so that the movements may be affected to a more or less extent by this fact, a result which increases the illusion effect in that the free end of the tentacle does not move in any definite orbit but has its movements controlled through the combined action of the several parts and any resistance afforded by the water.

The outer casing 12 may be normally held in either straight or contorted position by the proper shaping of leaf spring 17ᵃ, depending upon the nature of the organism that is to be simulated; but, in any event, the normal shape of rubber tube or sack 19 differs substantially from the normal shape of casing 12 as controlled by leaf spring 17ᵃ. The inflation of sack 19 naturally tends to make it assume its normal contour, with a force varying with the amount of air introduced therein; and as this contour differs from that of the casing 12, the casing will be moved from its normal form and will tend to assume the normal form of sack 19. In the exemplification illustrated, the casing 12 ordinarily is sinuous and irregular in form, while the sack 19 is normally straight. It will consequently be apparent that sack 19, when inflated, will exert its pressure mainly at the bends of casing 12, the pressure of the sack upon intermediate and relatively straight portions being much less than on the bends. In any desired construction, the difference in contour of casing and sack will inevitably result in a variation in the pressure exerted at spaced points.

As shown in Fig. 3 the tentacles have their inner ends located in positions where the valves 25 which control them are readily accessible to the operator. By providing openings 10ᵇ at suitable points in the shell, the operator is able to see the exposed portions of the tentacles and thus be able to readily control the inlet of air to or exhaust of air from the tube 19 of either of the tentacles.

The valves 25 are of a well-known type by means of which the admission of air to the tentacle and its exhaust therefrom is entirely within the control of the operator.

As will be understood, the illusion effect is based on the movements of the tentacles, so that the latter forms the main essential feature of the structure. Obviously, this idea can be employed in connection with other creature simulations where, for instance, a single structure of the type of tentacle shown herein is employed. For instance, if but one element of the tentacle type is employed, the shell may be omitted and the control of the air supply, and exhaust may be located at a considerable distance from such element, in which case it may be desirable to employ separate inlet and exhaust passages in plug 21, these leading to the valve which would be positioned at a material distance from the element, thus placing the operator outside of the view of the spectators. Such an arrangement could be employed to simulate the movements of an eel or a larger creature and could be employed in simulating the mythical sea-serpent.

While I have herein shown and described one way in which the principles of the invention may be embodied, it is readily understood that such principles may be employed through a wide range of simulations and illusion effects by changes and modifications in the design and construction of parts, and I desire to be understood as reserving the right to make any and all such changes as may be found necessary or desirable in producing the results aimed at, in so far as such changes and modifications may fall within the spirit and scope of the invention as expressed in the accompanying claims.

It is to be understood, of course, that where the invention is employed under conditions where buoyancy is not a material factor, as for instance, where the structure is used on the surface of the water, on land, or in the air, chain 20 may be omitted.

Having thus described my invention, what I claim as new, is:—

1. Means for producing life like motions of an inanimate object, comprising a main casing representing the body of said object, an elongated casing extending from the main casing, means for normally holding the elongated casing in a bent condition and air controlling means for varying a pressure uniform throughout the inner surface of the elongated casing to vary the effect of the bending means.

2. Means for producing life like simulations to an elongated inanimate object comprising a strong wear resisting elongated casing, a fluid tight casing within said first mentioned casing, means for normally holding both casings in a bent condition and fluid controlling means for varying a pressure uniform throughout the inner surface of the fluid tight casing to vary the effect of the bending means.

3. Means for producing life like simulations to an elongated inanimate object comprising an elongated outer wear resisting casing, an inner fluid tight casing, means for holding both casings extended, a spring for normally holding the casings in a bent condition and means for varying a pressure uniform throughout the surface of the inner casing to vary the effect of the bending spring.

4. Means for producing life like simulations to an elongated inanimate object under water comprising an elongated casing, a coil for holding the casing extended and increasing its buoyancy, means for holding the casing in a bent condition and means for varying a pressure uniform throughout the inner surface of the casing to vary the effect of the bending means.

5. Means for producing life like simulations to an elongated inanimate object under water comprising an elongated casing, means for normally holding the casing in a bent condition, an elongated flexible tapering weight for the casing to overcome the water buoyancy and means for varying a pressure uniform throughout the inner surface of the casing to vary the effect of the bending means.

6. Means for simulating a devil fish consisting of a main casing and tentacles radiating therefrom, each tentacle comprising an elongated casing, means for normally holding the elongated casing in a bent condition and means within the main casing for varying a pressure uniform throughout the inner surface of the elongated casing to vary the effect of the bending means.

7. Means for simulating a devil fish consisting of a main casing and tentacles radiating therefrom, each tentacle comprising an elongated casing, means for holding it in a bent condition, air pipes to and from the main and elongated casing, and air valves therein for varying the pressure within the elongated casing to vary the effect of the bending means and thus producing life like movements of the tentacle.

8. The method of producing life-like simulations of under-water creatures, which consists in positioning under water an inanimate casing simulating the appearance of a movable portion of the creature, subjecting such casing to the action of opposing pressures applied internally of the casing and variable relatively to each other to produce movements of the casing, and concurrently compensating for change in buoyancy conditions produced by such movements.

9. In apparatus for producing life-like simulations to elongated inanimate objects, a hollow casing of substantially-constant cross-sectional contour, and means operative within the casing for subjecting the casing to the action of opposing pressures variable relatively to each other and applied internally of the casing at spaced points so as to produce sinuous or wriggling motion.

10. In apparatus for producing life-like simulations to elongated inanimate objects, a hollow casing of substantially constant cross-sectional contour, means carried by the casing for providing a substantially constant pressure effect within the casing, and means for producing a variable pressure within the casing variably opposing said constant pressure effect at spaced points, whereby the casing may be subjected to the internal application of pressure differences variable at will.

11. In apparatus for producing life-like simulations to inanimate objects, a hollow casing of substantially constant cross-sectional contour, said casing having a general longitudinal contour tapering toward a movable end, means within the casing for providing a substantially constant pressure therein, and means for producing an opposing pressure of variable magnitude within the casing, said constant pressure means decreasing in resistance toward such movable end.

12. In apparatus for producing life-like simulations to inanimate objects, a hollow casing of substantially constant cross-sectional contour, said casing having a longitudinal contour generally tapering toward a movable end, a spring within the casing and adapted to produce a substantially constant pressure therein, said spring being varied as to resistance to decrease such resistance adjacent the movable end, and means for introducing and applying a fluid pressure within the casing in opposition to said substantially constant pressure, said fluid pressure means including control mechanism for varying fluid pressure.

13. In apparatus for producing life-like simulations to elongated inanimate objects, a hollow casing of substantially constant

cross-sectional contour, a spring within the casing adapted to provide a predetermined positioning of casing portions, and means for applying fluid pressure within the casing in opposition to the pressure of said spring to effect movements of spaced casing portions from such positions in different directions to produce sinuous or wriggling motion.

14. In apparatus for producing life-like simulations to inanimate objects, a hollow casing of substantially constant cross-sectional contour, a spring extending longitudinally of the casing and adapted to provide a substantially constant pressure therein, a fluid pressure receiving element within the casing, and means for controllably introducing a fluid pressure medium into said element, said element being positioned to provide an opposing pressure to said spring with such pressure, variable by control of the introducing means.

15. In apparatus for producing life-like simulations to inanimate objects, a hollow casing of substantially constant cross-section and having an external configuration in simulation of the movable portion of the creature being simulated, said casing including outer and inner casing members in nested relationship, said inner member having a longitudinal pocket, a flexible frame within the inner member adapted to maintain the cross-sectional contour of the casing substantially constant, a spring in said pocket adapted to provide a substantially constant pressure to the casing, and means for applying a variable fluid pressure within the casing, said means being ineffective to vary the cross-sectional contour and operating in opposition to such constant pressure to provide movements to the casing.

16. In apparatus for producing life-like simulations to inanimate objects, a hollow casing of substantially constant cross-section and having an external configuration in simulation of the movable portion of the creature being simulated, said casing including outer and inner casing members in nested relationship, said inner member having a longitudinal pocket, a flexible frame within the inner member adapted to maintain the cross-sectional contour of the casing, a tubular bag or sack within said flexible frame, and means for controllably introducing a fluid pressure medium to said bag or sack to provide a pressure opposing the substantially constant pressure of said spring.

17. In apparatus for producing life-like simulations to inanimate objects, a hollow casing of substantially constant cross-section and having an external configuration in simulation of the movable portion of the creature being simulated, said casing including outer and inner casing members in nested relationship, said inner member having a longitudinal pocket, a flexible frame within the inner member adapted to maintain the cross-sectional contour of the casing substantially constant, a spring in said pocket adapted to provide a substantially constant pressure to the casing, a tubular bag or sack within said flexible frame, a flexible member within and extending longitudinally of said bag or sack, and means for controllably introducing a fluid pressure medium into said bag or sack to provide a pressure opposing the constant pressure of said spring, said flexible member being adapted to compensate for change in buoyancy conditions of the casing.

18. In apparatus for producing life-like simulations of under-water creatures, a hollow casing of substantially constant cross section and having an external configuration in simulation of the movable portion of the creature being simulated, said casing including a casing member having a longitudinal pocket, a flexible frame within such member adapted to maintain the cross-sectional contour of the casing substantially constant, a spring in said pocket adapted to provide a substantially constant pressure to the casing, a tubular bag or sack within said flexible frame and adapted to receive a fluid pressure medium tending to vary the buoyancy of the casing, means for controlling the admission and withdrawal of such fluid pressure medium, and a flexible member within and extending longitudinally of the bag or sack, said flexible member being adapted to compensate for change in buoyancy conditions of the casing.

19. In apparatus for producing life-like simulations of under-water creatures, a hollow casing of substantially constant cross-section and having an external configuration in simulation of the movable portion of the creature being simulated, said casing including a casing member having a longitudinal pocket, a flexible frame within such member adapted to maintain the cross-sectional contour of the casing substantially constant, a spring in said pocket adapted to provide a substantially constant pressure to the casing, a tubular bag or sack within said flexible frame and adapted to receive a fluid pressure medium tending to vary the buoyancy of the casing, means for controlling the admission and withdrawal of such fluid pressure medium, said casing frame and spring having a general tapered configuration toward a movable end of the casing, and a flexible member within and extending longitudinally of said bag or sack and adapted to compensate for change in buoyancy conditions of the casing, said mem-

ber comprising a chain having its links decreased in weight and size toward such movable end.

20. In apparatus for producing life-like simulations to inanimate objects, a structure having an external configuration simulating the external appearance of the creature being simulated, said structure including a shell and a casing extending from said shell, means for subjecting the casing to the action of opposing pressures variable relatively to each other and applied internally of the casing, said means including mechanism for introducing a fluid pressure medium within the casing, and means operative within the shell for controlling the admission of such medium to the casing.

21. In apparatus for producing life-like simulations to inanimate objects, a structure having an external configuration simulating the external appearance of the creature being simulated, said structure including a shell and a casing extending from said shell, means for subjecting the casing to the action of opposing pressures variable relatively to each other and applied internally of the casing, said means including mechanism for introducing a fluid pressure medium to and withdrawing it from the casing, and means operative within the shell for controlling such admission and withdrawal of the medium.

22. In apparatus for producing life-like simulations to inanimate objects, a structure having an external configuration simulating the external appearance of the creature being simulated, said structure including a shell and a plurality of independent casings extending from said shell, means whereby one or more of said casings may be subjected to the action of opposing pressures variable relatively to each other and applied internally of such casing or casings individually, said means including mechanism for introducing a fluid pressure medium to and withdrawing it from the casing to provide movement-activity thereto, and means operative within the shell for controlling the fluid pressure operations of the active casing or casings individually and at will.

In testimony whereof I affix my signature.

JOHN ERNEST WILLIAMSON.