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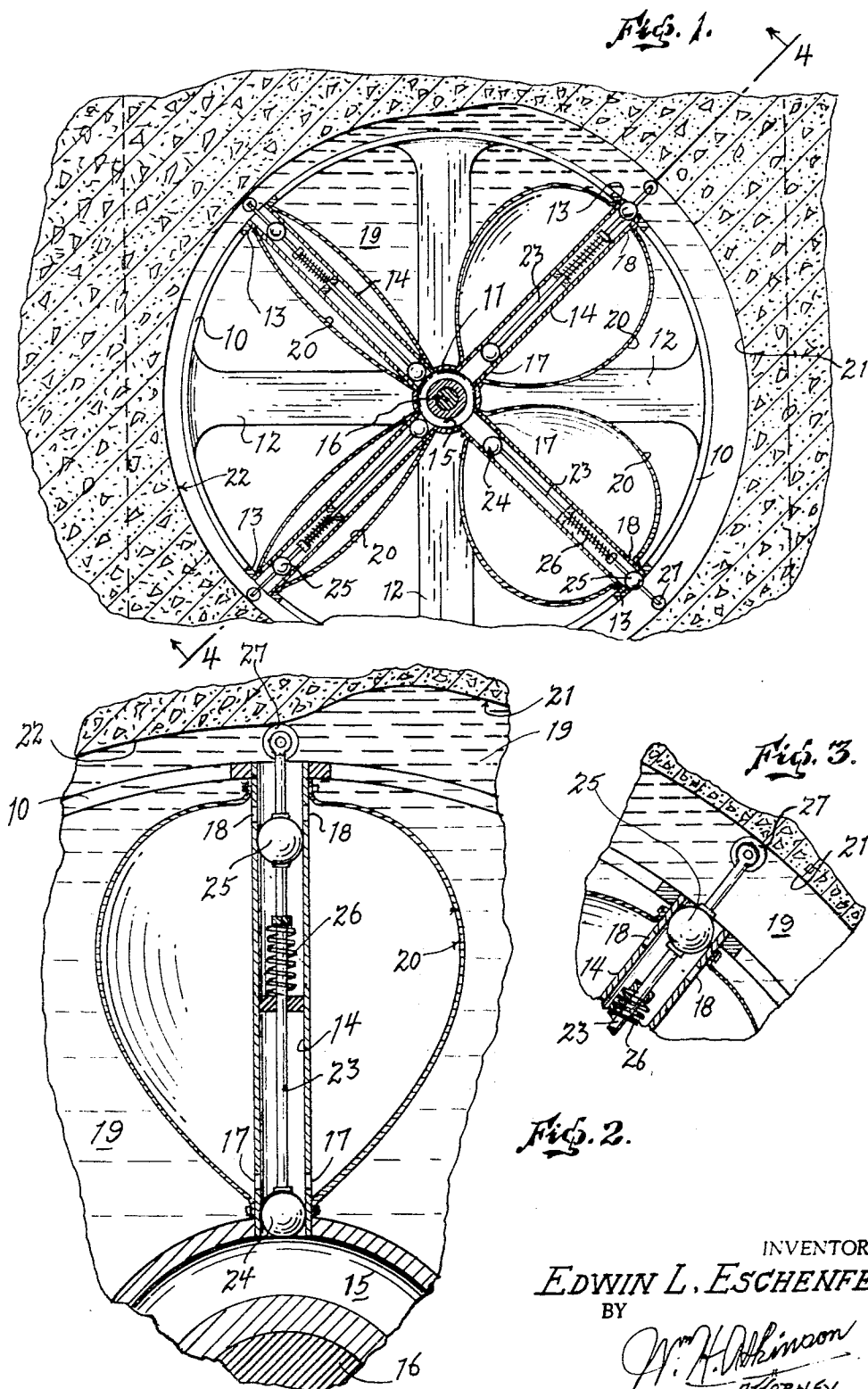
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HYDROPNEUMATIC POWER WHEEL

Filed Feb. 28, 1968

2 Sheets-Sheet 1



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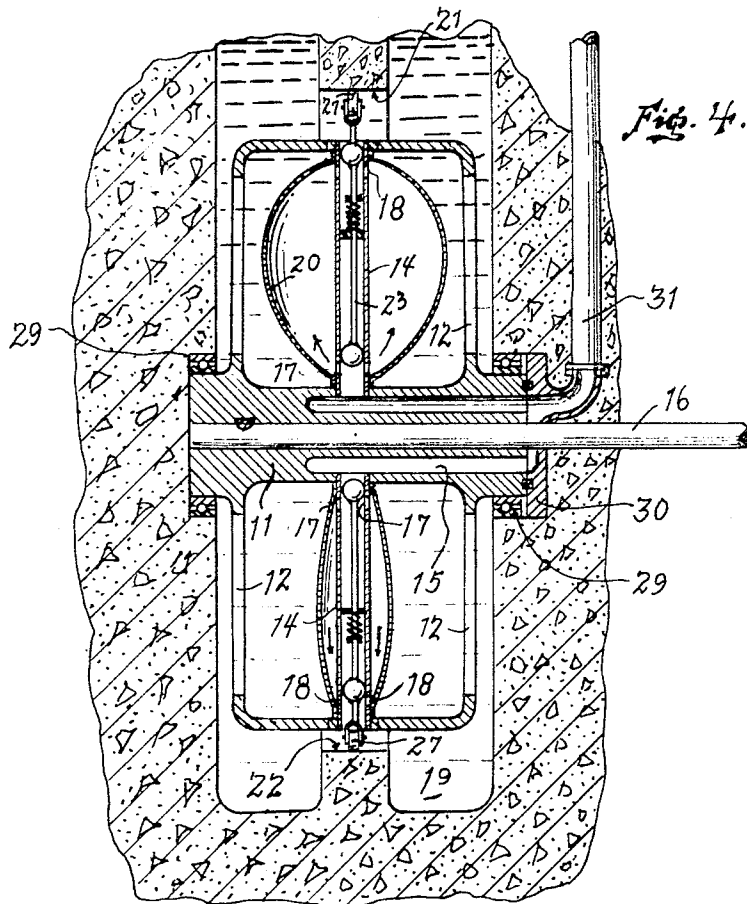
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HYDROPNEUMATIC POWER WHEEL

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4 Claims

ABSTRACT OF THE DISCLOSURE

The invention involves a device in the form of a rotatable cage-like member having a central hub with a compressed air inlet that is adapted to operate in a submerged position below the level of a body of water and mounted within the cage-like member there is a plurality of radially extending open ended tubularspoke-like members having intermediate air admission and exhaust ports. The inner ends of these spoke-like members communicate with the compressed air inlet of the central hub and at the outer ends these tubular spoke-like members communicate with the body of water in which the device is submerged. Surrounding each of the tubular spokes there is an inflatable balloon-like means which encompasses the intermediate air admission and exhaust ports of said tubular spoke-like members and operating within each of these spoke-like members there is a valve means by which the intermediate air admission and exhaust ports of said spoke-like members are alternately opened and closed when said valve means operates. Surrounding the cage-like member in the plane in which said spoke-like members move, there is a camming surface with which said valve means engages, said camming means being adapted and arranged to alternately open and close the intermediate inlet ports and exhaust ports of said tubular spoke-like members to thus successively inflate and deflate said balloon-like members as the cage-like member turns about its axis with respect to said camming surface and establish a difference in the buoyancy of said balloon-like members at opposite sides of its axis of rotation.

This invention relates to a hydropneumatic power producing means.

The object of my invention is to provide a novel and submersible hydropneumatic power producing means having radially spaced inflatable members mounted to move about a horizontal axis which, when submerged, will provide a buoyant leverage effect as the members are inflated and deflated in a novel manner at opposite sides of their axis of rotation.

Other objects and advantages will be in part evident to those skilled in the art and in part pointed out hereinafter in the following description taken in connection with the accompanying drawings wherein there is shown by way of illustration and not of limitation a preferred embodiment of the invention.

In the drawings wherein like numerals refer to like parts throughout the several views:

FIGURE 1 is a vertical sectional view of the power producing wheel taken in a plane transverse to the axis of rotation,

FIGURE 2 is an enlarged fragmentary sectional view showing in more detail one of the elements of the unit as shown in FIGURE 1,

FIGURE 3 is a fragmentary view showing a portion of FIGURE 2 as in another position, and

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1 looking in the direction of arrows.

For a more detailed description of the invention reference is now made to the accompanying drawings wherein the numeral 10 designates a cage-like member having a

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hub 11 with radially extending solid spokes 12 at each end thereof and longitudinally extending bars 13 forming a support for open ended tubular spokes 14 that are connected at their inner ends with a compressed air supply chamber 15 formed within hub 11. As shown the hub 11 is keyed to a power output shaft 16. Each of the tubular spokes 14 have intermediate air inlet ports 17 at their inner ends and outlet ports 18 at their outer ends where the tubular spokes 14 are opened to the surrounding chamber which, as indicated, will be completely filled with water 19. In this manner the cage-like member 10 will be submerged when in operation. Surrounding each of the tubular spokes 14 and sealed thereupon at their inner and outer ends there is a balloon-like member 20. These balloon-like members 20, as is more clearly shown in FIGURES 2 and 3 of the drawings encompass the inlet ports 17 and the air outlet ports 18 located at points respectively short of the inner and outer ends of the tubular spokes 14. Surrounding the cage-like member 10 and in the plane of the tubular spokes 14 there is a cam means having an outer camming surface 21 and an inner camming surface 22 that are disposed at opposite sides of the vertical center of the cage-like member 10. Mounted within each of the tubular spokes 14 there is a double acting valve means 23 having spaced spherical portions 24 and 25 which respectively operate to alternately open and close the ports 17 and 18 of the tubular spokes 14. As shown, each of the valve members 23 are biased into an outward position by a spring means 26 and at their outer ends they have a cam engaging roller 27 which will render the valve member 23 responsive to the camming surfaces 21 and 22 of the cam means.

For purposes of illustration, the balloon-like members 20 are shown in FIGURE 2 as fully inflated, but it is to be understood that at this instant the valve-like member will have been moved inwardly against the bias of the springs 26 so that the ports 18 at the outer ends of the tubular spokes 14 will be opened while at the same time the ports 17 at the inner ends of the spokes 14 will be closed against the admission of air under pressure from the chamber 15 of the hub 11. Therefore it will be understood that the air which has been admitted to inflate the balloon-like members 20 will be free to exhaust through the ports 18 of the tubular spokes 14 and escape into the body of water 19 in which the device is submerged, in other words, the balloon-like members 20 will collapse as shown at the left of FIGURE 1, whereas when the cam engaging roller 27 of the valve means 23 is in contact with the camming surface 21 of the surrounding cam, the air inlet port 17 and the outlet port 18 of the tubular spokes 14 will be closed against the exhaust of the air through the ports 18 while at the same time admitting air through the port 17 of the tubular spokes and into the interior of the balloon-like members 20.

As is more clearly shown in FIGURE 4 of the drawings, the camming surfaces 21 and 22 surrounding the cage-like member 10 are disposed in the plane of the tubular spoke-like members 14 so that the outer ends of the spoke-like members 14 when supported by the longitudinally extending bars 13 of the open cage-like member 10 will permit a complete submergence of the entire assembly. As here indicate, the cage-like member 10 is supported for rotation upon suitable bearings 29 and the compressed air chamber 15 of the hub 11 is connected through a properly sealed packing gland 30 with a compressed air supply conduit 31 through which air under pressure from a suitable source is maintained within the chamber 15 of the hub 11. When thus submerged and the balloon-like members 20 are successively inflated and deflated at opposite sides of the hub 11, and imbalance will be established due to the difference in the buoyancy of the inflated and deflated balloon-like members 20 which

will cause the cage-like member 10 and the shaft 19 to rotate counterclockwise as viewed in FIGURE 1 of the drawings.

In the operation of my invention it is contemplated that the hub 11 may have an axially dimension of more than six feet and the outer perimeter of the cage-like member 10 will have a circumference approximating thirty to forty feet with the other parts increased proportionately. The cage-like member 10 is shown in FIGURE 4 as submerged within a well of water 32 containing the water 19, but it is to be understood that with suitable supporting bearings 29 the cage-like member may be submerged in any open body of water.

While I have, for the sake of clearness and in order to disclose the invention so that the same can be readily understood, described and illustrated a specific device and arrangement, I desire to have it understood that this invention is not limited to the specific means disclosed, but may be embodied in other forms that will suggest themselves to persons skilled in the art.

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

1. In a hydropneumatic power wheel, the combination of a substantially cylindrical rotatable cage-like member having a hub with a compressed air inlet chamber and a power delivery shaft mounted for rotation around a horizontal axis, a plurality of centrally disposed radially extending open ended tubular spokes mounted within said cage-like member and communicating with said air inlet chamber having intermediate air inlet ports at their inner ends and air exhaust ports at their outer ends, a valve means mounted within each of said tubular spokes having a cam engaging extension for alternately opening and closing said inlet and exhaust ports, and inflatable balloon-like member sealed about each of said tubular spokes and encompassing the inlet and outlet ports of said tubular spokes, and a cam means surrounding said cage-like

member for operating said valve means at one side of the axis of said hub to admit air into the ascending inflatable balloon-like members and permit the exhaust of air from the descending balloon-like members at the opposite sides of said axis, whereby said balloon-like members will be inflated and deflated as the cage-like member turns with respect to said cam surface and thus establish a difference in the buoyancy of said balloon-like members at opposite sides of the axis of rotation of said cage-like member.

2. The invention as set forth in claim 1, characterized by the fact that the valve means mounted within said tubular spokes is in the form of two spherical valve members carried by a radially extending rod having an outwardly extending end for engagement with the cam means disposed about the cage-like member.

3. The invention as set forth in claim 1, characterized by the fact that said balloon-like members have oppositely disposed openings through which said tubular spokes are extended with their intermediate ports encompassed thereby.

4. The invention as set forth in claim 1, characterized by the fact that said cage-like member is of cylindrical form having a central hub with rigid radially extending spokes and a cylindrical portion which is open between said tubular spokes to permit a complete immersion of said balloon-like members when the cage-like member is submerged in a body of water.

References Cited

UNITED STATES PATENTS

3,360,926 1/1968 Parr ----- 60—22

FOREIGN PATENTS

77,646 6/1949 Czechoslovakia.

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