L. PIERCE.

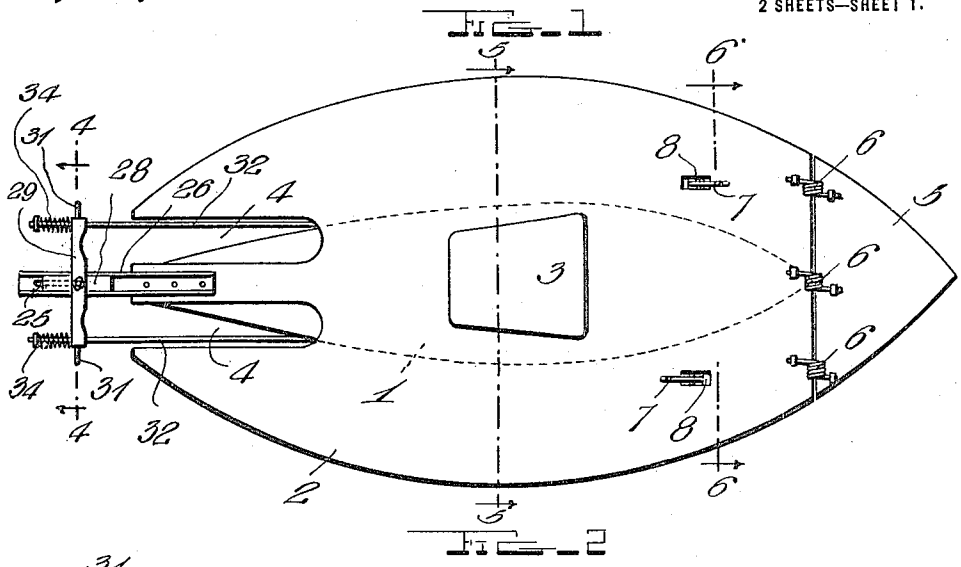
DIVING BOAT.

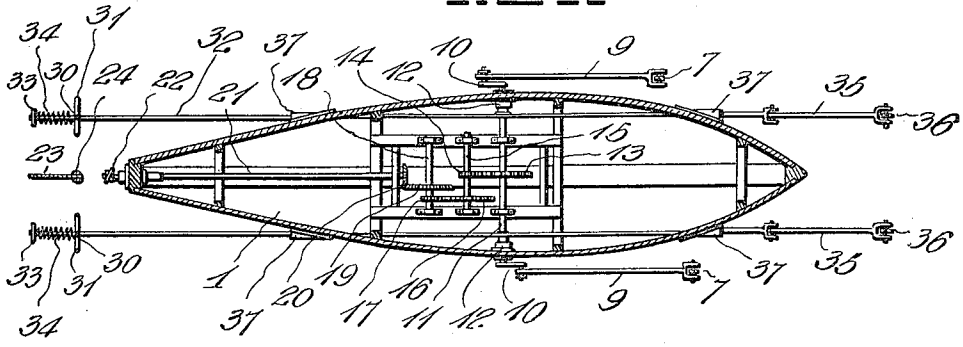
APPLICATION FILED MAR. 23, 1916.

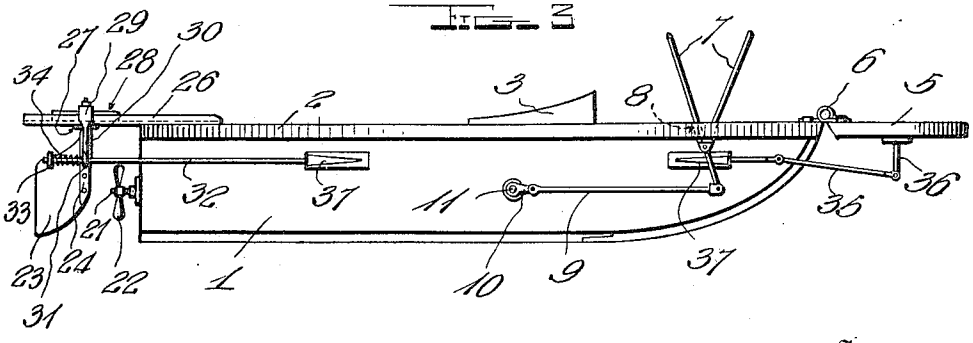
1,223,730.

Patented Apr. 24, 1917.

2 SHEETS—SHEET 1.







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2 SHEETS—SHEET 2.

FIG. 4

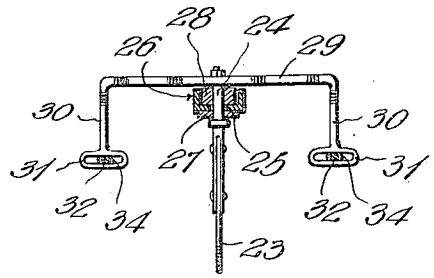


FIG. 5

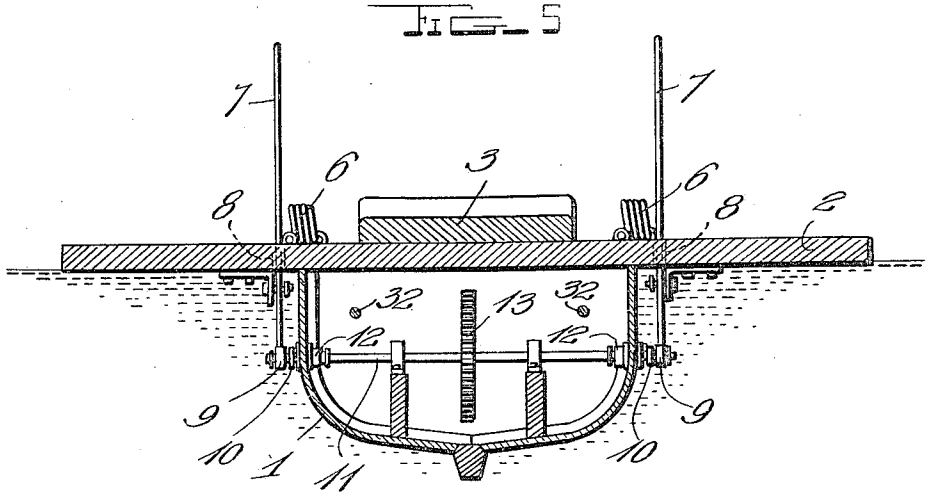
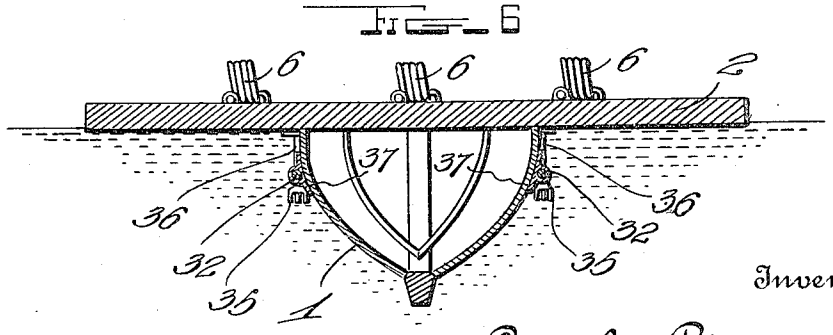


FIG. 6



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UNITED STATES PATENT OFFICE.

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DIVING-BOAT.

1,223,730. Specification of Letters Patent. Patented Apr. 24, 1917.

Application filed March 23, 1916. Serial No. 86,190.

To all whom it may concern:

Be it known that I, LINCOLN PIERCE, a citizen of the United States, residing at Tucson, in the county of Pima and State of Arizona, have invented certain new and useful Improvements in Diving-Boats; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention which is an improved manually propelled boat, has for its object to provide a device of this class so constructed as to allow it to dive under the surface of the water at the will of the operator, thus affording a great deal of amusement and pleasure, the device being primarily for use at pleasure resorts fronting on bodies of water.

With this general object in view, the invention consists of certain novel features of construction and unique combinations of parts to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawings which constitute a part of this application and in which:

Figure 1 is a top plan view of the improved boat;

Fig. 2 is a horizontal section through the hull thereof;

Fig. 3 is a side elevation; and

Figs. 4, 5 and 6 are vertical transverse sections taken on the planes indicated by the lines 4—4, 5—5 and 6—6 of Fig. 1.

In the embodiment illustrated, the numeral 1 designates a suitably shaped hull whose upper side is closed by an approximately elliptical deck 2 upon which the operator of the boat lies, the intermediate portion of the deck being provided with a chest rest 3, while the rear end thereof is formed with notches 4 adapted to receive the lower limbs of the operator, these provisions being necessary for reasons yet to be described.

The front end of the deck 2 is in the form of a vertically swinging submerging rudder 5 which, if tilted downwardly while the boat is being propelled forwardly, will cause the same to dive under the surface of the water, said rudder also serving to allow the craft to again return to the surface. The rudder may be mounted in any appropriate manner, but it is preferably connected with the deck proper by spring hinges 6 serving normally to retain it in a horizontal position.

In advance of the chest rest 3, a pair of hand levers 7 rise through slots 8 in the deck 2, the lower ends of said levers being connected by pitman rods 9 with opposed cranks 10 on the opposite ends of a shaft 11 extending transversely through and projecting from the intermediate portion of the hull 1, appropriate stuffing boxes 12 being provided for the purpose of preventing the entrance of water into said hull around the shaft. The shaft 11 is provided with a comparatively large gear 13 meshing with a pinion 14 on a second transverse shaft 15, the latter in turn having a large gear 16 meshing with a pinion 17 on a third transverse shaft 18. The last named shaft is provided with a comparatively large bevel gear 19 meshing with a bevel pinion 20 on the front end of a propeller shaft 21 projecting through the stern of the hull 1 and carrying a propeller 22. Thus, when the levers 7 are oscillated by the person lying upon the craft, the gear described will rotate the propeller 22 at a high rate of speed to propel the boat.

For steering the device to the right and left a rudder 23 is provided, the post 24 of said rudder being passed through a slot 25 in a channel iron guide 26 which is secured to and projects rearwardly from the deck 2. A slide plate 27 is fixed on the post 24 in contact with the under side of the guide 26, while an additional slide 28 is mounted in the channel of said guide, being also mounted on the post. For turning the post 24, a transverse horizontal steering bar 29 is secured to the upper end thereof, said bar being suitably shaped to be engaged by the operator's feet. Thus, the rudder 24 may be turned at will to steer the boat laterally, all sliding connections described being essential for reasons to be set forth.

Depending from the ends of the bar 29, are upright arms 30 here shown as having transversely extending loops 31 on their lower ends which slidably receive a pair of rods 32 therein. The rear ends of rods 32 are equipped with stops 33 between which

and the aforesaid loops 31, coil springs 34 are interposed. The front ends of the rods 32 are connected by links or the like 35 to crank arms 36 which are secured to and depend from the submerging rudder 5. By this arrangement, when the operator pushes rearwardly on the bar 29 with both feet, the rods 32 will be also moved in this direction, thereby tilting the rudder 5 downwardly to submerge the boat as the same is being propelled forwardly by manipulation of the levers 7. During this submerging operation, the slides 27 and 28 and the rudder carried thereby will move rearwardly, and by now properly operating the bar 29, the user of the device may steer the latter from side to side while traveling beneath the surface of the water.

In the present embodiment of the invention, the rods 32 are shown as extending through stuffing boxes 37 into the hull 1, but this arrangement is not essential, since in some cases the rods in question might be disposed totally on the exterior of the boat.

The improved craft, when constructed and used as above described, will furnish a great amount of exercise and sport for the operator and will also be amusing to onlookers.

In the preceding, certain specific details of construction have been described for accomplishing probably the best results, and in the drawings such details have been shown. It will be obvious, however, that numerous changes may be made within the scope of the invention as claimed without sacrificing the main advantages thereof.

I claim:—

1. A manually operated diving boat comprising a hull having a horizontal deck upon which the operator lies, said deck being adapted to normally travel on the surface of the water, means for propelling the boat, a rudder for guiding the same laterally, an additional rudder for submerging the craft, and a single operating member for both rudders designed to be actuated by the feet of the user.

2. A manually operated diving boat comprising a hull having a deck upon which the operator lies, said deck being adapted to normally travel on the surface of the water, propelling means for the boat, a submerging rudder, an operating member therefor movable forwardly and rearwardly and capable of turning in a horizontal plane, said member being adapted to be operated by the feet of the user, and an additional rudder operated by the aforesaid operating member for guiding the boat when said member is turned as specified.

3. A manually operated diving boat comprising a hull having a deck upon which the operator lies, said deck being adapted to travel on the surface of the water, means for propelling the boat, a vertically swinging submerging rudder at the front end of the boat, a pair of crank arms depending from said rudder, a pair of rods extending rearwardly from said arms, a rearwardly movable cross bar having yielding connections at its ends with the rear ends of said rods, said bar being capable of turning in a horizontal plane, and a steering rudder operated by said operating bar for guiding the boat when turned as specified.

4. A manually operated diving boat comprising a hull having a deck upon which the operator lies, said deck being adapted to travel on the surface of the water, means for propelling the boat, a vertically swinging submerging rudder at the front end of the boat, a pair of crank arms depending from said rudder, a pair of rods extending rearwardly from said arms, a rearwardly movable cross bar having yielding connections at its ends with the rear ends of said rods, said bar being capable of turning in a horizontal plane, a fixed guide carried by the rear end of the boat, a slide movable forwardly and rearwardly on said guide and having a pivotal connection with the operating bar, and a second rudder secured to said bar for guiding the boat when said bar is turned as specified.

5. A manually operated diving boat comprising a hull having a deck upon which the operator lies, means for propelling the boat, a vertically swinging submerging rudder at the front end of the boat, a pair of crank arms depending from said rudder, a pair of rods leading rearwardly from said crank arms, stops on the rear ends of said rods, springs on said rods bearing against the stops, a transverse operating bar adapted to be engaged by the feet of the operator and having sliding connections at its ends with the aforesaid rods, being in contact with the front ends of the springs thereon, said bar being capable of turning in a horizontal plane, and a rudder secured to and depending from the center of said bar for guiding the boat when said bar is turned as stated.

6. A manually operated diving boat comprising a hull having a deck upon which the operator lies, means for propelling said boat, a submerging rudder at the front end of said boat, a rearwardly movable operating member to be engaged by the feet of the operator, and connections between said operating member and the rudder for operating the latter when the former is shifted.

7. A manually operated diving boat comprising a hull having a deck upon which the operator lies, said deck extending beyond the hull and being adapted to travel on the surface of the water, a propeller for the boat, a driving gear for said propeller disposed in the hull, a shaft extending trans-

versely through the hull for operating said driving gear, cranks on the ends of said shaft, pitmen connected with said cranks, and hand levers connected at their lower ends with said pitmen and rising through slots in the deck to be grasped by the operator.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LINCOLN PIERCE.

Witnesses:
JOHN W. LUMLEY,
EDWARD BURNES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."