July 14, 1925. 1,546,188

F. W. BALDWIN

WATER DRIVE

Original Filed May 14, 1921

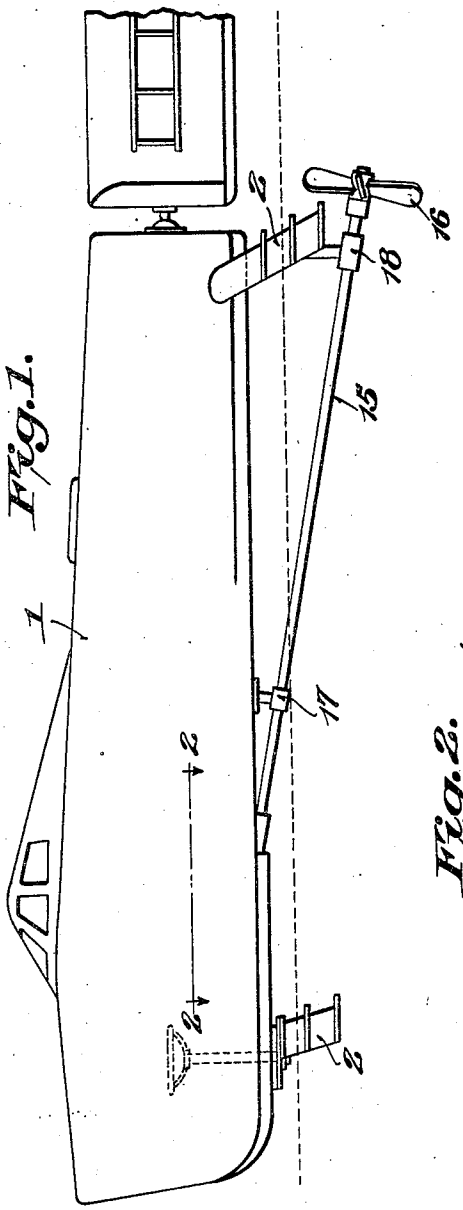


Fig. 1.

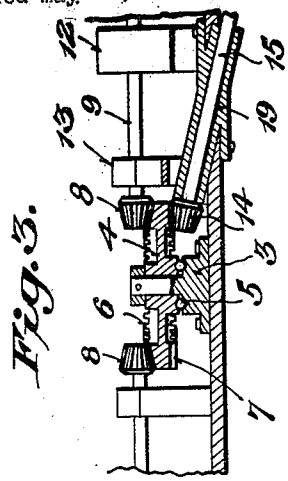


Fig. 3.

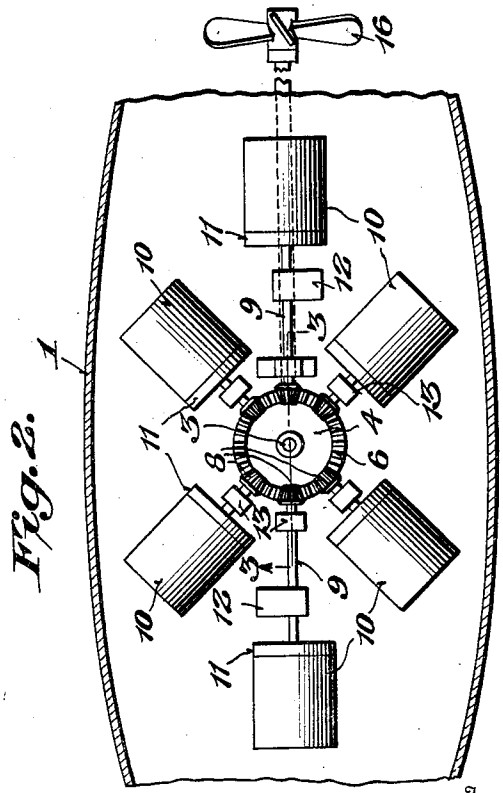


Fig. 2.

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UNITED STATES PATENT OFFICE.

FREDERICK WALKER BALDWIN, OF BADDECK, NOVA SCOTIA, CANADA

WATER DRIVE.

Original application filed May 14, 1921, Serial No. 469,725. Divided and this application filed January 19, 1923. Serial No. 613,704.

To all whom it may concern:

Be it known that I, FREDERICK WALKER BALDWIN, a subject of the King of Great Britain, and a resident of Baddeck, Nova Scotia, Canada, have invented new and useful Improvements in Water Drives, which invention is fully set forth in the following specification.

This invention relates to an improved water drive for vessels and particularly to a water propeller drive for securing very high speeds in hydrodromes, hydroplanes and the like.

One of the objects of this invention is to provide improved means whereby a maximum amount of power may be transmitted to a propeller shaft.

In my application, Serial Number 469,725, filed May 14, 1921, of which this is a division, I have diagrammatically illustrated one embodiment of this invention installed in a vessel, wherein is employed a simple horizontal gear, preferably mounted upon a large race with roller or ball bearings, and which gear is rotated by a plurality of motors (as many as six or more, if desired). The propeller is mounted on a downwardly and rearwardly inclined shaft to the upper end of which is secured a pinion that meshes with the lower face of said horizontal gear.

Aside from the simplicity of construction and effectiveness in transmitting the power of the motors to the propeller, my improved drive is of importance from the point of view of speed in the provision of a single driving shaft. The strength of the shaft and its ability to transmit a given horsepower varies as the cube of its diameter, whereas its resistance in the water varies directly as its diameter. Thus, if a one-inch shaft can transmit 100 horsepower at a given R. P. M., then a two-inch shaft can transmit 800 horsepower at the same R. P. M., and yet the two-inch shaft has only twice the resistance in the water that the one-inch shaft has. Therefore, the underwater resistance is the same, yet the power transmitted is four times as great with a single shaft as with two smaller shafts.

The invention will be better understood by reference to the accompanying drawings, wherein is shown one expression of the inventive idea, and wherein—

Fig. 1 is a side elevation of a hydrodrome car provided with my improved drive;

Fig. 2 is a diagrammatic top plan view of one embodiment of my invention; and

Fig. 3 is a section on the line 3—3 of Fig. 2.

Referring to the drawings, wherein like reference numerals refer to like parts throughout the several views, 1 is a hydrodrome car, adapted to be supported when moving at high speed through the water by sets of hydrofoils 2.

Suitably secured within the hull of car 1 at any convenient point is the bearing member 3, which supports a ring gear 4. Ball bearings 5, or any other suitable friction reducing means, is preferably interposed between gear 4 and bearing member 3.

The upper face 6 of gear 4, as well as the lower face 7 thereof, is beveled and toothed. In engagement with the upper toothed portion of gear 4 are a plurality of bevel pinions 8 carried on the ends of shafts 9 operatively connected to engines 10. Preferably, said engines are arranged in diametrically disposed pairs with their shafts radial with respect to the center of gear 4.

Suitable clutch means 11 may be interposed between shafts 9 and engines 10 in order that one or more of the engines may be disconnected at will. Reversing mechanism, diagrammatically illustrated at 12, 12, may be employed in connection with a sufficient number of engines to give the backing or reversing power desired. In order that pinions 8 may be maintained rigidly in contact with gear 4, any suitable bearing means 13 may be employed to support shafts 9 adjacent said pinions.

Engaging the lower toothed portion of gear 4 is the pinion 14 secured to one end of shaft 15. A propeller 16 is secured to the opposite end of shaft 15, the latter being suitably supported by struts 17, 18 and by means of bearing or stuffing box 19 secured to the bottom portion of the hull of car 1.

The operation of my improved water drive is as follows. Any one or all of the opposed motors or engines 10 being started by hand or by electrically actuated means (not shown), clutches 11 are thrown and power is transmitted to propeller shaft 15 by means of pinions 8, ring gear 4 and pinion 14, the heavy ring gear acting as a fly-wheel to smooth out any pulsations of the motors. The speed of the craft may be controlled by

throttling the supply of fuel to the motors in a well known manner, or by cutting in or out one or more of the motors.

It will be perceived that my improved disposition and arrangement of engines or motors and transmission mechanism greatly reduces the number of elements in said mechanism, greatly decreases the cost of installation, requires a minimum of space, reduces the underwater resistance, and takes advantage of the great reduction of weight obtained by using motors having a number of small cylinders and of the facility with which any engine can be cut out or brought into action at will for the purpose of decreasing or increasing the power output or for the purpose of facilitating starting and manœuvring.

While the invention has been illustrated as embodied in a water propeller drive for a hydrodrome car, it is to be expressly understood that the invention is equally applicable to the driving of any shaft where it is desired to deliver a maximum of power. Furthermore, any desired number of motors or engines may be employed and since certain features of the invention are capable of use without other features thereof, the limits of the invention are to be determined by reference to the claims hereto appended.

What is claimed is:—

1. A water drive comprising in combination with a hull, a plurality of power units radially disposed in pairs about a common point on the longitudinal axis of the hull, said units being provided with inwardly extending shafts, a horizontally disposed flywheel mounted to rotate about said common point in a plane located below said shafts, said flywheel being provided with gear teeth on its upper and lower faces, means for selectively establishing a driving connection between the upper gear teeth of the flywheel and one or more of said units, propelling means including a shaft, said shaft extending through said hull at an angle to the plane of said flywheel, and driving means secured to said shaft and having engagement with the teeth on the lower face of said flywheel.

2. A water drive comprising in combination with a hull, a plurality of pairs of power units radially disposed about a common point on the longitudinal axis of the hull, inwardly extending driving shafts for each of said units, a horizontally disposed flywheel mounted to rotate about said common point in a plane located below said shafts, said flywheel being provided with gear teeth on its upper and lower faces, pinions carried by said shafts and having driving engagement with the teeth on the upper surface of said flywheel, means for disconnecting the driving connection between said flywheel and any one of said units, propelling means including a shaft extending through said hull at an angle to the plane of said flywheel, and a pinion secured to the upper end of said shaft and having driving engagement with the teeth on the lower face of said flywheel.

In testimony whereof I have signed this specification.

FREDERICK WALKER BALDWIN.