Dec. 21, 1937. H. M. ROCKWELL 2,103,183

WATER BUOYED ENGINE AND MOUNTING FOR MOTOR BOATS AND THE LIKE

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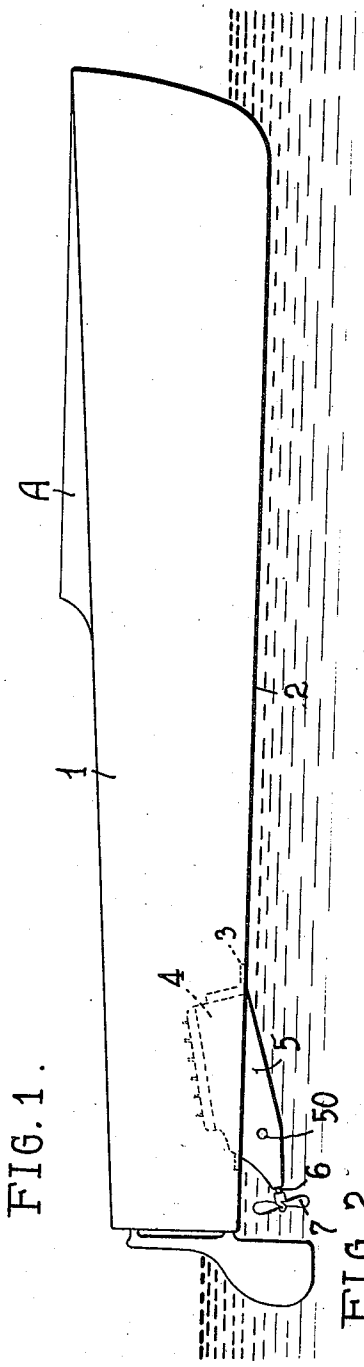

FIG. 1.

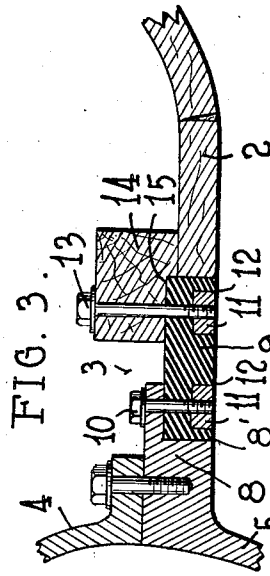

FIG. 3.

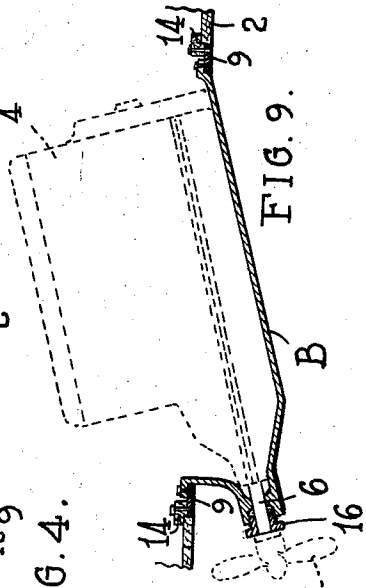

FIG. 4.

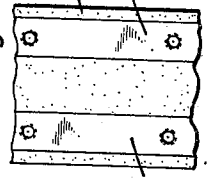

FIG. 5.

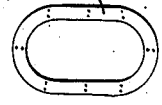

FIG. 8.

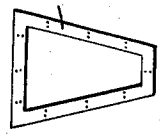

FIG. 7.

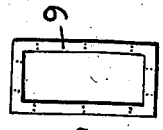

FIG. 6.

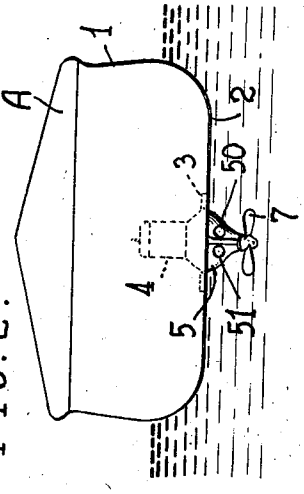

FIG. 2.

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WATER BUOYED ENGINE AND MOUNTING FOR MOTOR BOATS AND THE LIKE

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Application June 16, 1934, Serial No. 730,953

12 Claims. (Cl. 115—34)

My invention relates to motor boats, launches and other motor propelled marine craft, and more particularly to water buoyed motors and mountings for motor boat engines and the like.

It is one of the objects of my invention to flexibly and/or resiliently mount the motor or engine in the craft so that the weight of the motor or engine, as far as possible or practical, is supported by the water.

Another object of the invention is to so support the motor or engine that it is flexibly supported in such a way that whether the engine is over or under the weight of the water displaced by the engine, it is held in a position suitable for proper operation, and in this manner a simple self-contained power and propulsion unit is provided, inexpensive to install and of a type that lessens noise and eliminates vibration being transmitted to the boat.

Still further objects of the invention are to cool the oil in the bottom of the engine casing, thereby eliminating the usual oil cooler, eliminating the usual and customary journal or bearing in the hull of the boat, and in some cases the necessary coupling between the engine and the propeller shaft.

Other objects will be apparent, particularly to those skilled in the art, upon further perusal of the specification.

My invention broadly contemplates floatably supporting the motor or engine which may be accomplished by providing in the bottom of the hull of the boat a suitable opening in which the motor is flexibly and/or resiliently supported and providing a water-tight joint between the motor and the hull.

The motor may drop down below the bottom of the boat, and the water displaced by the motor will assist in supporting the same. Instead of having the motor in direct contact with the water, I may support a pan or adapter in the opening and have the motor rest in the pan. In this form there will be a suitable bearing and stuffing box in the pan for supporting the motor shaft. In the first form, the stuffing box may be in the end of the crank case.

In each form of my invention it may not be possible to keep an absolute balance so that the engine accurately displaces its weight in water, but the nearer this point is approached, the less weight one way or the other will have to be carried by the engine mounting. In any event, much of the weight of the engine is supported directly by the water and it is possible that there may be conditions where there is a greater force exerted upwardly on the engine than the weight of the engine.

My invention will be better understood by reference to the accompanying drawing in which:

Figure 1 is a side elevation of a motor boat and the like showing my water buoyed engine and mounting, with parts in dotted lines.

Figure 2 is an end elevation of the same.

Figure 3 is a sectional detail view showing the flexible mounting for the motor.

Figures 4 and 5 are detail views of the flexible mounting.

Figures 6, 7 and 8 are views showing some of the various shapes the flexible mounting may assume, as desired, and

Figure 9 is a fragmentary view partly in section of a modified form of my invention.

Upon referring to the drawing, A designates generally a motor boat or other power propelled craft having the hull 1 provided with a bottom 2. In the bottom 2 of the hull may be provided a suitable opening 3 of any suitable contour in which is located the engine 4 and extending below the hull bottom. The opening 3 in the bottom of the hull is preferably located aft, although it may be located forward as in racing craft, or at any point desired. The engine 4 has the crank case 5 through which extends a motor or propeller shaft 6 having a suitable propeller 7 thereon. The crank case may be provided with an extended flange 8 having a rabbet 8' along its lower outer edge. For resiliently supporting the motor from the hull I employ flexible and/or resilient supporting means 9. This flexible supporting means may be made of vulcanized rubber and may be in the form of strips and the like if desired. It may also be made in one continuous piece, if convenient. This resilient supporting means may be made of the same thickness as the depth of the rabbet 8' in the flange of the crank case, and is secured thereto in any suitable manner. I prefer to secure the resilient supporting means to the flange of the crank case by means of bolts 10. The resilient supporting means may have secured in its lower face the non-corrodible metal strips 11 which are located in grooves 12 in the bottom face of the resilient supporting means. These metal strips may be left free in the groove, or they may be vulcanized and bonded in place. As shown in Figures 4 and 5, these strips of non-corrodible metal may be entirely embedded in the resilient supporting means.

The outer end of the resilient supporting means may be secured to the bottom of the hull by means of bolts 13 passing through bed mem-

bers 14. These bed members are rabbeted as at 15 to receive the outer ends of the resilient supporting means when the resilient supporting means is of greater thickness than the bottom of the hull. When the bolts are screwed home, a water-tight joint is provided between the resilient supporting means and the engine motor flange, and also between the resilient supporting means and the hull of the boat.

The engine or motor rests on the water and is resiliently suspended or attached to the bottom of the boat. The resilient supporting means may be formed in strips, as many as desired, and as shown in Figures 6, 7, and 8 may be of various shapes to conform to the preferred opening in the hull of the boat. While I have illustrated a rectangular, trapezoidal, and an oval shaped opening, yet openings of other shapes or contours may be employed if preferred.

The portion of the crank case in the water may be provided with an intake pipe 50 which will conduct cooling water through the crank case to the water jacket of the engine. A similar pipe 51 may be employed to conduct the water from the water jacket. By making these conduits or passages in the crank case, flexible connections may be eliminated. It may be preferable in a large number of instances to have the incoming cooling water come through the casing as by means of the pipe 50 or other suitable means, and have the outgoing water lead into the engine exhaust pipe which in turn will pass through an opening in the hull of the boat. With an arrangement of this kind, the outlet for the exhaust water and engine gases would require a flexible connection to permit of the sliding relative movement between the hull and the engine, but it would not be necessary to have a flexible connection for the incoming water, as this inlet is located through the crank case by means of the pipe 50. If desired, I may have the inlet for the cooling water, and the outlet for the cooling water, and the exhaust pipe all pass through the crank case so as to eliminate all flexible connections, and have a more self-contained engine unit.

As a modified form, as shown in Figure 9, I may employ a pan or adapter B, which adapter is supported in the opening in the hull by the resilient supporting means, and the engine or motor 4 is mounted in the pan B or adapter. A suitable stuffing box 16 and bearing is provided in the pan.

When the engine or motor 4, with or without the pan or adapter B, is properly mounted in the opening 3 in the hull of the boat, the opening is completely closed and no water can leak through into the hull. The engine is relatively low in the boat and if desired can be covered up in any suitable manner to provide additional space. Further, by having the engine so mounted, a low center of gravity is obtained. The vertical center of gravity of the engine may be off the center of the opening in the boat in order to partly correct for propeller torque or there may be struts to offset this reaction, but in the majority of installations the plain rubber mountings shown in the drawing are sufficient to take care of torque reactions. It is within the scope of my invention to provide arms or guards projecting from the engine casing to the hull so that when the boat is out of water, the total weight of the engine will not be taken on the flexible engine mount. Further, a projection may be made downwardly from the engine casing or boat in order to protect the propeller in shallow water.

In the embodiment of my invention shown herein, I have only illustrated and referred to a single engine, but it is possible that one or more could be used as desirable or practicable. Further, the engine may be surrounded by water-tight compartments or bulkheads and the like so that leaks of any nature in other parts of the boat will not reach the engine compartment, or leaks of any nature in the engine compartment will not get to the other parts of the boat.

Other minor changes in my invention will be apparent to those skilled in the art.

What I claim is:

1. A motor boat provided with an opening in its bottom, a complete power plant including a propeller and a shaft mounted as a unit in the bottom of a boat hull, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of said complete power plant, and a flexible and resilient water tight mounting joining the power plant directly to the boat, and permitting relative universal movement between the power plant and the boat bottom.

2. A motor boat and the like having a hull provided with an opening in its bottom, a power plant disposed within the opening, a flexible and resilient mounting substantially surrounding the power plant and constituting the sole means of support for the power plant from the boat, said power plant being suspended from the boat by the mounting, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the power plant, and water tight connections between the mounting and the power plant and between the mounting and the hull.

3. In a motor boat having an opening in its bottom and a propulsion unit mounted in said opening, and a flexible and resilient supporting means for the unit substantially surrounding the unit and connected to said unit and the boat in a water-tight manner, said propulsion unit being suspended from the boat by the supporting means, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the propulsion unit.

4. A complete engine propelling unit including a propeller and shaft, a flexible mounting surrounding the engine and extending through an opening in the bottom of the hull of the boat and suspending the engine, and having universal movement relative to the boat, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the propelling unit.

5. A boat with an opening in the bottom of its hull, an engine flexibly mounted in said opening and a water tight, slightly yieldable engine mounting connecting the engine to the boat bottom and so arranged that the engine is positioned against side loads and end loads by the mounting, the area of the opening in the hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the engine.

6. A motor boat provided with an opening in its bottom, a pan means so flexibly supported in the opening as to have universal movement relative to the boat bottom, an engine supported by the pan and water tight connections between the pan and the boat, the area of the opening in the boat bottom being so proportioned that the upward weight of the water on said area is approximately equal to the weight of the pan and the engine supported thereby.

7. A motor boat having an opening in the bottom of its hull and a motor suspended in the opening, means secured to said motor and hull sealing said opening and floatably and flexibly mounting said motor therein so that the motor will have universal movement relative to the hull, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the motor.

8. A motor boat and the like having a hull provided with an opening in its bottom, a power plant disposed in the opening and projecting below the bottom, a flexible and resilient mounting substantially surrounding the power plant and constituting the sole means of support for the power plant from the boat, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the power plant, and water tight connections between the power plant and the mounting and between the mounting and the hull.

9. A motor boat and the like having a hull provided with an opening in its bottom, a power plant disposed within the opening and projecting below the boat bottom, a resilient mounting substantially surrounding the power plant and forming a water tight connection between the power plant and the boat, whereby the power plant is floatably supported, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area is approximately equal to the weight of the power plant.

10. A motor boat having an opening in the bottim of its hull and a motor suspended in the opening, means secured to said motor and hull sealing said opening and floatably and flexibly mounting said motor therein so that the motor will have universal movement relative to the hull, the area of the opening in the boat hull being so proportioned that the upward pressure of the water on said area takes up a substantial portion of the weight of the motor.

11. A motor boat and the like having a hull provided with an opening in its bottom, a power plant disposed in the opening and projecting below the bottom, and a flexible and resilient mounting completely surrounding the power plant, with the mounting securely fastened to the power plant and the boat hull and making a permanent, water-tight connection, with the mounting completely submerged in the water at all times.

12. A motor boat and the like having a hull provided with an opening in its bottom, a power plant disposed in the opening and projecting below the bottom, and a flexible and resilient mounting completely surrounding the power plant and suspending the power plant from the boat hull, with the center of gravity of the power plant being within the confines of the mounting and the carrying load taken at approximate right angles to the mounting enclosure, the mounting being at all times in contact with the water and providing a water-tight seal.

HUGH M. ROCKWELL.