Sept. 7, 1937. A. BRAGA 2,091,958

MOTOR BOAT

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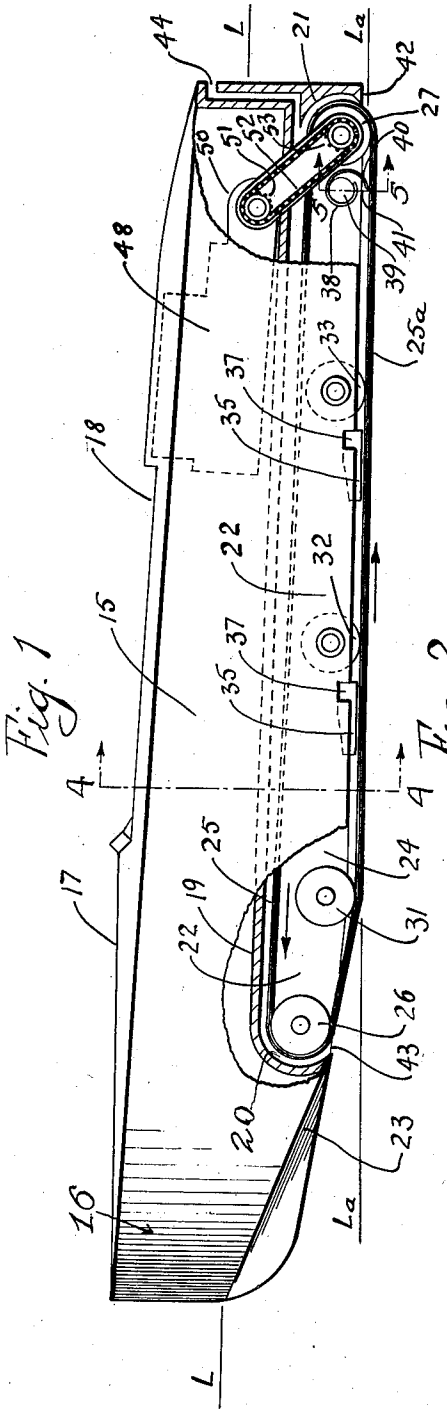


Fig. 1

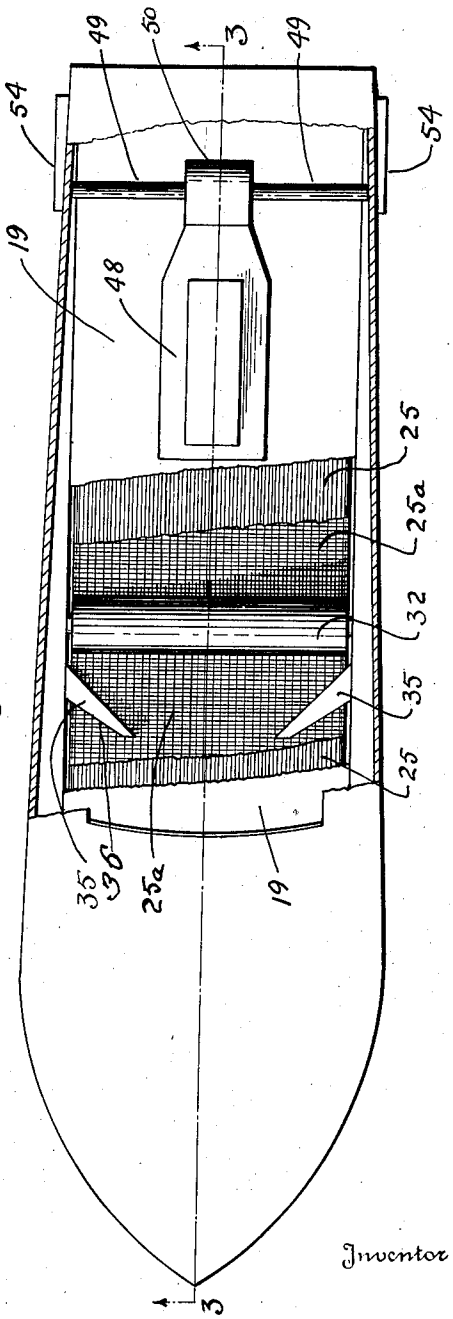


Fig. 2

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MOTOR BOAT

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Fig. 3

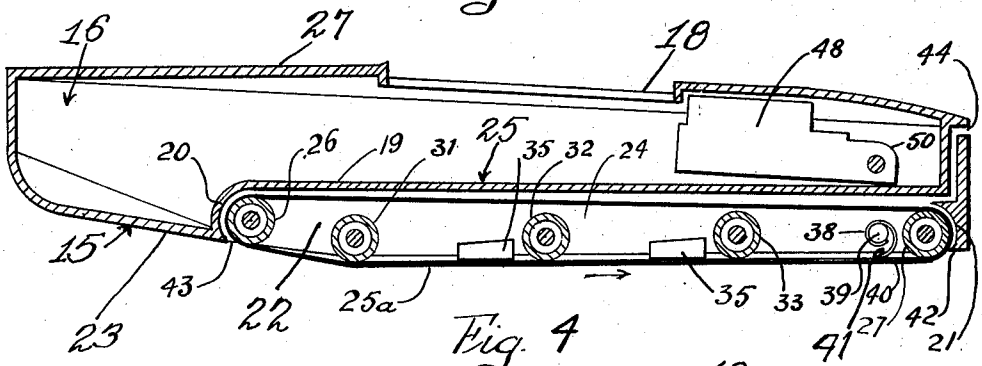


Fig. 4

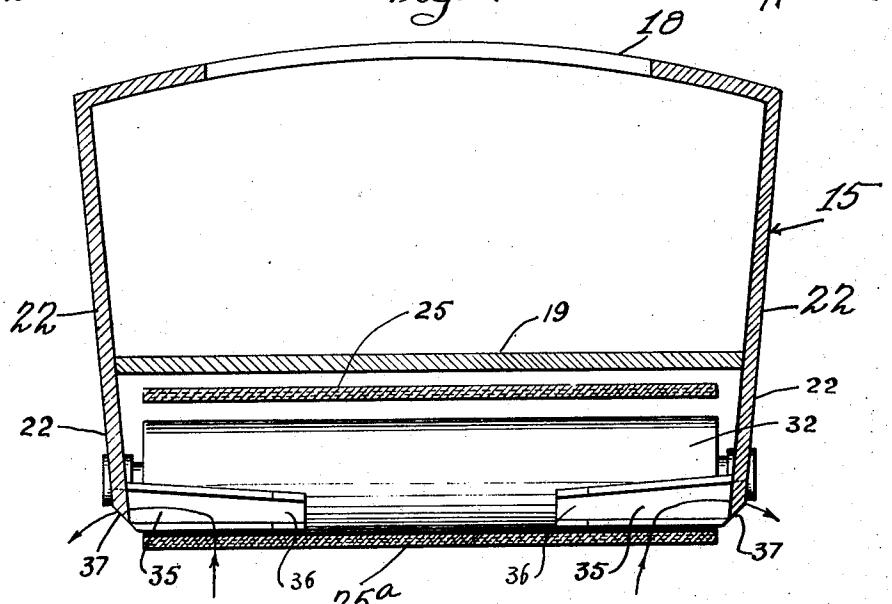
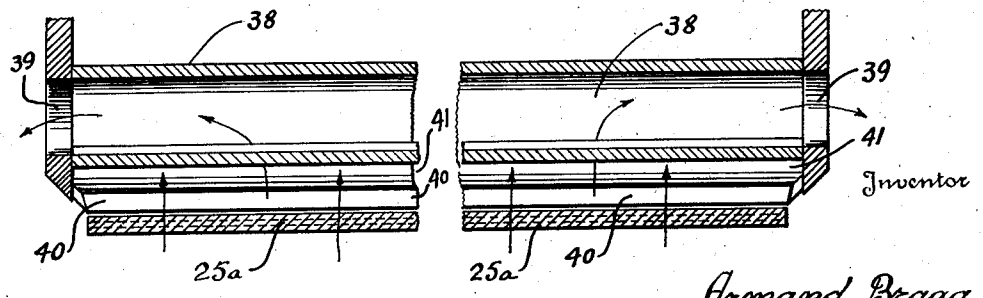


Fig. 5



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Fig. 6

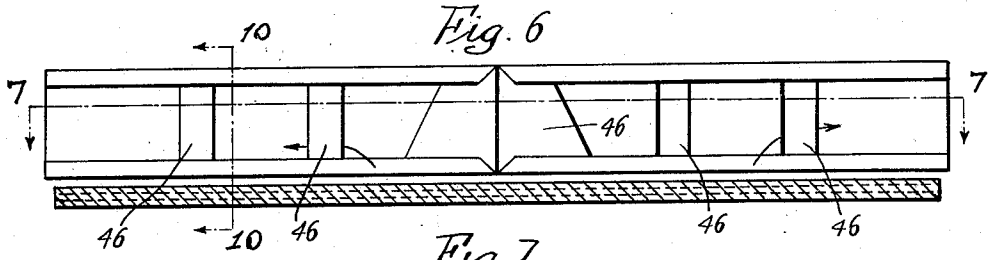


Fig. 7

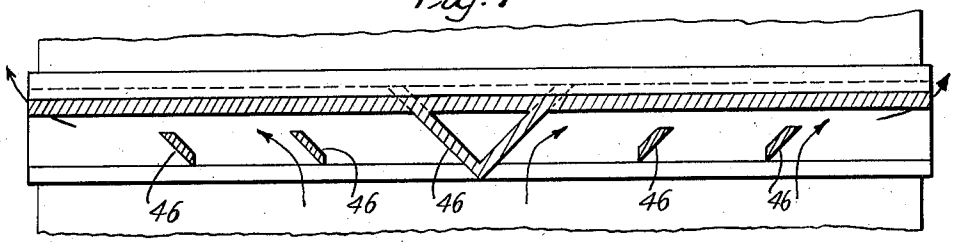


Fig. 8

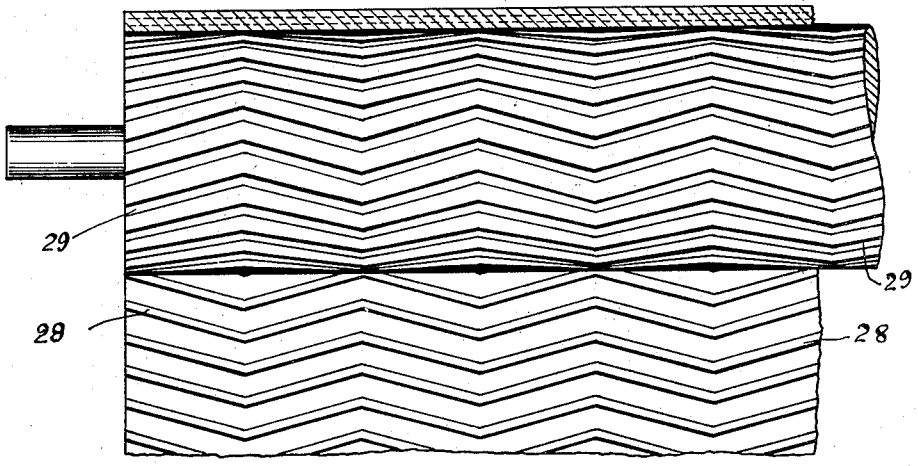


Fig. 9

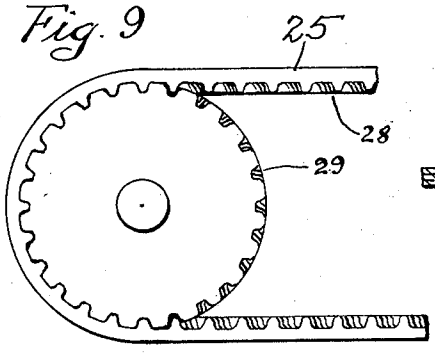
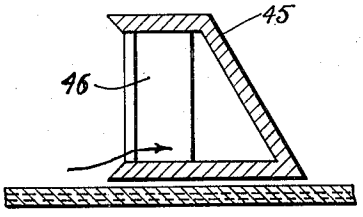


Fig. 10



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Patented Sept. 7, 1937 2,091,958

UNITED STATES PATENT OFFICE

2,091,958

MOTOR BOAT

Armand Braga, Kearny, N. J.

Application February 12, 1936, Serial No. 63,620

10 Claims. (Cl. 115—63)

My invention relates to motor boats.

An important object of the invention is to provide a motor boat which may be driven at the maximum speed with the minimum power.

A further object of the invention is to reduce to the minimum the resistance of the water to the travelling hull of the boat, when the motor boat is driven at a sufficiently high speed, the moving propeller belt being then substantially the only portion of the boat contacting with the water, and the air offering substantially the only resistance to the travel of the boat.

A further object of the invention is to provide means to discharge the water from the recess of the hull, when the propeller-belt is driven, thereby increasing the buoyancy of the boat and causing the same to rise in the water.

A further object of the invention is to provide a motor boat of the above mentioned character which is relatively simple in construction and easy to operate.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation, parts broken away, of a motor boat embodying my invention,

Figure 2 is a plan view of the same, parts broken away,

Figure 3 is a central vertical longitudinal section taken on line 3—3 of Figure 2,

Figure 4 is a transverse section taken on line 4—4 of Figure 1,

Figure 5 is an enlarged transverse section taken on line 5—5 of Figure 1,

Figure 6 is a side elevation of a modified form of water outlet device,

Figure 7 is a horizontal section taken on line 7—7 of Figure 6,

Figure 8 is a plan view of one of the end rollers and propeller-belt,

Figure 9 is a side elevation of one of the end rollers and propeller-belt, and,

Figure 10 is a transverse section taken on line 10—10 of Figure 6.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 15 designates the hull of a motor boat, as a whole, having a preferably pointed or tapered bow 16, while its stern is preferably relatively wide. The hull 15 is provided with a deck or cover 17, and a cockpit 18, as is customary. The hull further embodies a raised bottom 19, having curved end portions 20 and 21, and sides 22 of the hull project downwardly below the raised bottom 19, for a substantial distance, so that their lower edges conform to the outline of the water contacting bottom of the hull, a portion of this water contacting bottom being shown near the bow at 23. The raised bottom 19, with the sides 22 and ends 20 and 21 form an exterior chamber or recess 24, having its bottom open, as shown. Operating within this exterior chamber 24 is an endless propeller-belt 25, passed about forward and rear rollers 26 and 27, arranged within the chamber 24, near its ends and suitably mounted upon the hull. In order that the endless propeller-belt may not slip longitudinally upon these rollers or shift laterally thereon, such propeller-belt is provided upon its inner surface with transverse sets of herring-bone ribs or teeth 28, to engage within the peripheries of the rollers 26 and 27. Other suitable means may be employed to positively gear the endless propeller-belt with the rollers. Guide rollers 31, 32 and 33 are provided and are arranged between the rollers 26 and 27 and are suitably mounted upon the hull. These guide rollers engage the lower run 25a of the endless propeller-belt 25, as shown. Particular attention is called to the fact that the lower run 25a has its central longitudinal axis in alignment with and beneath the central longitudinal axis of the hull 15, and the lower run is arranged adjacent to and slightly beneath the lower edges of the sides 22, and the lower run constitutes, in effect, the major portion of the lower bottom of the hull. The forward portion of the lower run 25a is preferably inclined in relation to the central portion and forms a continuation of the bottom portion 23. At running speed, the lower run 25a will plane on the upper surface of the water, like the bottom of an ordinary hydroplane type boat.

Means are provided to expel the water from within the recess 24, by the travel of the belt, comprising stationary chutes or troughs 35, Figures 1, 2 and 4. These chutes or troughs are preferably arranged in pairs and are transversely inclined with respect to the longitudinal axis of the hull 15. The ends and forward side 36 of these chutes or troughs are open. These chutes or troughs are stationary with respect to the hull and their outer ends are rigidly attached to the sides 22 of the hull and such outer ends discharge through openings 37, in the sides 22. The chutes or troughs 35 are arranged above and ad-

jacent to the lower run 25*a*, and since this lower run is travelling rearwardly, in the direction of the arrow, Figures 1 and 3, such lower run feeds the water into these chutes or troughs and such water will thereby be expelled through the chutes or troughs from the interior of the recess 24.

Means also are provided to expel from the recess 24, water which may pass the chutes or troughs 35. This means comprises a transverse tube 38, arranged in the rear portion of the recess 24 and fixedly attached to the sides 22. The ends of the tube 38 communicate with openings 39, formed in the sides 22. The opposite ends of the tube 38 therefore lead to the exterior of the sides 22. The tube has a depending inclined lip 40 arranged adjacent to the lower run 25*a*, to scoop up the water thereon and cause the water to enter the tube through a longitudinal passage 41, as shown.

The numeral 42 designates a scraping blade or edge, arranged adjacent to the lower run 25*a*, as it passes about the roller 27. This blade or edge prevents an excess of water passing with the endless propeller-belt into the chamber or recess 24, exteriorly of the endless propeller-belt, causing the water to be deflected backward. The propeller-belt is spaced slightly from the wall of the recess 24, whereby there is a passage above the endless propeller-belt. The water in this passage above the endless propeller-belt, as well as the water that may pass the scraping blade, will be discharged from the passage at the point 43. To permit the free discharge of the water from within the recess, an air vent 44 is provided, passing to a point above the water line L—L while at rest, and communicating with the recess, at its rear end.

In Figures 6 and 7, I have shown a modified form of water expelling means, which may be used in place of the troughs 35 or the tube 38, or both. This water expelling means comprises a trough or chute 45, formed approximately U-shaped in cross-section and having its forward side and its ends open. The chute or trough 45 will be located at the same point occupied by the trough 35 and the tube 38, and of course they would be removed. The ends of the chute or trough are rigidly attached to the sides 22 and the open ends of the chute or trough discharge into openings corresponding to the openings 37 and 39. Arranged within the chute or trough 45 are sets of spaced inclined baffles 46, diverging outwardly in opposite directions, which will force the water in opposite directions to be discharged from the recess 24. This type of water expeller has the advantage of being possible to be placed very close to the roller, and the closer it is, the less the sagging of the belt and there is less danger of damage to the belt by the lower side of the trough.

Arranged within the rear end portion of the hull 15, is a prime mover, such as an internal combustion engine 48, serving to drive a transverse shaft 49 through the medium of suitable gearing within the gear case 50. At its opposite ends, the transverse shaft 49 carries sprocket wheels 51, rigidly mounted thereon, engaged by sprocket chains 52, extending downwardly to engage sprocket wheels 53, which are fixedly attached to the roller 27, to turn therewith. The sprocket wheels and sprocket chains operate within housings 54, formed upon the sides 22, as shown.

The hull may be equipped with any suitable form of rudder or guide means, not shown.

The operation of the motor boat is as follows:

In Figure 1, the water line is indicated at L—L and the motor boat is shown in the position which it will assume when at rest. When the engine 48 is started, the endless propeller-belt 25 is driven in the direction of the arrows, and the water contained within the recess 24 is expelled from the same, causing air to enter through opening 44 and take its place. This increases the buoyancy of the motor boat which now rises and the skin friction between the lower run 25*a* of the endless propeller-belt and the water causes the motor boat to travel forwardly. As the speed of the motor boat increases, it continues to rise, until the hull and the lower run 25*a* ride on the surface of the water. When the motor boat picks up sufficient speed so that it reaches the maximum elevation, the lower surface of the lower run 25*a* is substantially the only portion of the motor boat contacting with the surface of the water. During this operation, the level of the water may be regarded as indicated by the line L*a*—L*a*. When the lower run 25*a* is thus travelling upon the upper surface of the water, substantially the only resistance to the travel of the motor boat, then present, is the resistance of the air, for substantially all portions of the boat are out of contact with the water excepting the travelling lower run 25*a*. The speed of the propeller-belt is greater than the speed of the motor boat, as there is a certain amount of slippage between the lower run 25*a* and the water. The lower run of the belt moves backwards in relation to the water by the amount of slip and in relation to the hull by the amount of slip plus the speed of the hull.

It is to be understood that the forms of my invention herewith shown and described are to be taken as preferred examples of the same and that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A motor boat comprising a hull having a recess, an endless propeller-belt connected with the hull to drive it, means to drive the endless propeller-belt, and means coacting with the endless propeller-belt to expel the water from the recess when the propeller-belt is driven.

2. A motor boat comprising a hull having a recess, an endless propeller-belt operating within the recess, means to drive the endless propeller-belt, and means for expelling water from inside the belt.

3. A motor boat comprising a hull provided at its bottom with a recess to receive water, an endless propeller-belt operating within the recess and having its lower run positioned adjacent to the lower bottom of the hull, means to drive the propeller belt, and means to expel water from the recess including a conduit arranged within the endless propeller-belt and adjacent to the lower run and having a passage to receive water propelled by the propeller-belt.

4. A motor boat comprising a hull provided at its bottom with a recess to receive water, an endless propeller-belt operating within the recess, transversely inclined troughs fixed to the hull and arranged within the endless propeller-belt and adjacent to the lower run of the propeller-belt, the outer end of each trough discharging at a point exteriorly of the recess, and means to drive the propeller-belt.

5. A motor boat comprising a hull provided at its bottom on the outer side with a recess to re-

ceive water, an endless propeller-belt operating within the recess, transverse troughs spaced longitudinally of the endless propeller-belt and arranged adjacent to one run of the same to scoop up water from the travelling run, the transverse troughs discharging to the exterior of the recess, and means to drive the endless propeller-belt.

6. A motor boat comprising a hull provided at its bottom with a recess to receive water, an endless propeller-belt operating within the recess and spaced from the wall of the recess to produce a space, the endless propeller-belt serving to discharge water from the forward end of the space, means arranged at the rear end of the space to scoop water from the exterior of the propeller-belt, means to allow air to enter the recess, and means to drive the propeller-belt.

7. A motor boat comprising a hull provided with a recess, an endless propeller-belt operating within the recess, means for driving said belt, and means for expelling water from inside said belt, the boat being provided with a passage for the admission of air into said recess as the water is expelled therefrom.

8. A motor boat comprising a hull provided at its bottom with a recess, an endless propeller-belt operating within the recess and spaced from the wall thereof, means at the stern end of said belt for scooping water from the exterior surface thereof, and means for driving said belt.

9. A motor boat comprising a hull, rollers journaled in said hull, an endless propeller-belt extending around said rollers longitudinally of the hull and having a relatively smooth outside surface, and means for driving one of said rollers at relatively high speeds, the driven roller and the inside surface of said belt being provided with interengaging means preventing both relative movement of said belt with respect to the driven roller in the direction parallel to the axis of rotation of the driven roller and peripheral slippage of said belt with respect to the driven roller.

10. A motor boat comprising a hull, an endless propeller-belt, rollers at the forward and stern ends of said propeller-belt for supporting the same, and means for driving said propeller-belt, the boat being provided with means for reducing the volume of water which otherwise would be drawn in between the inside surface of the belt and the stern roller whereby the water pressure at this point is kept relatively low.

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