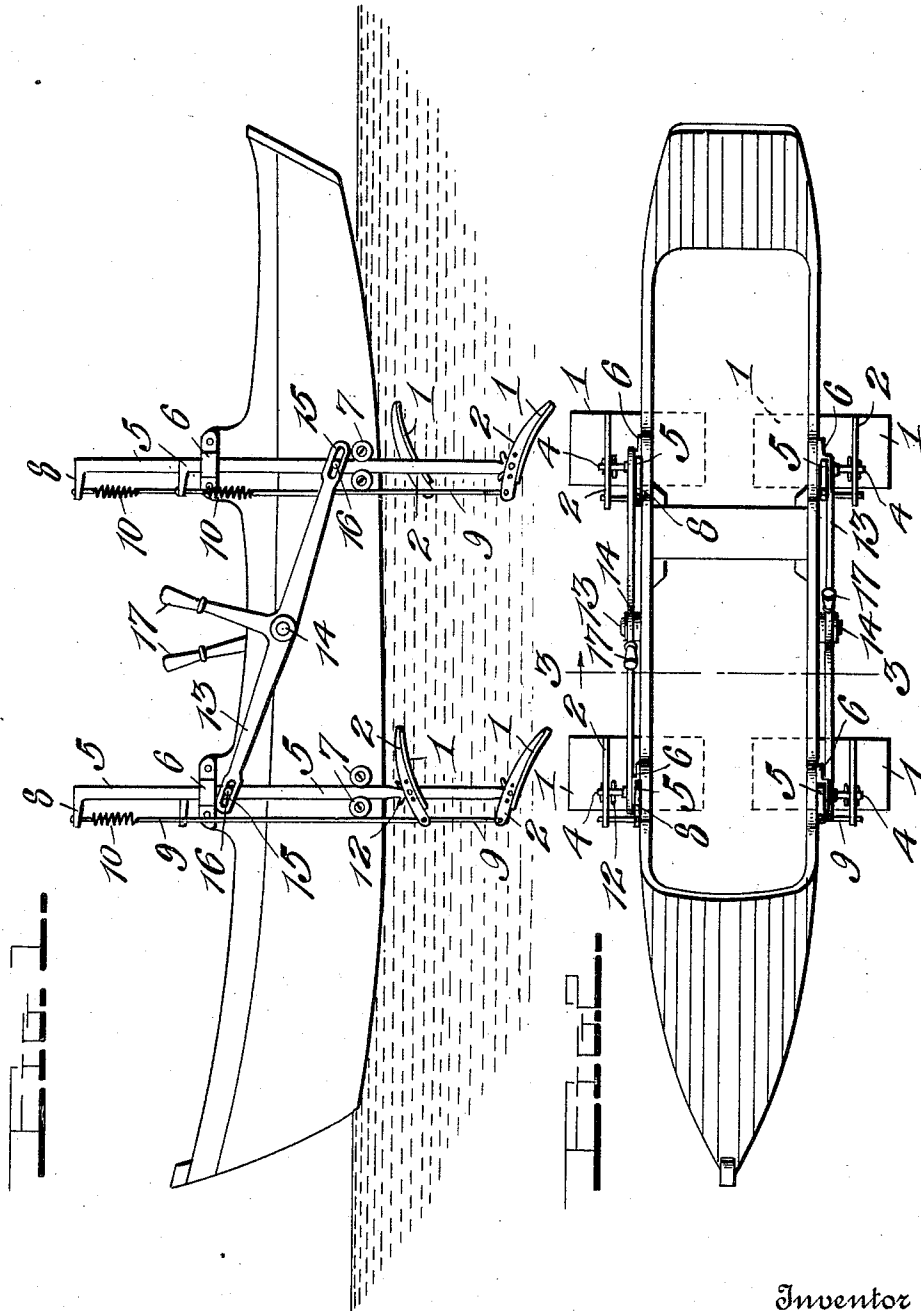


G. R. NAPIER.
 PROPELLING APPARATUS FOR BOATS.
 APPLICATION FILED SEPT. 1, 1910.

1,006,118.

Patented Oct. 17, 1911.

3 SHEETS—SHEET 1.



Witnesses

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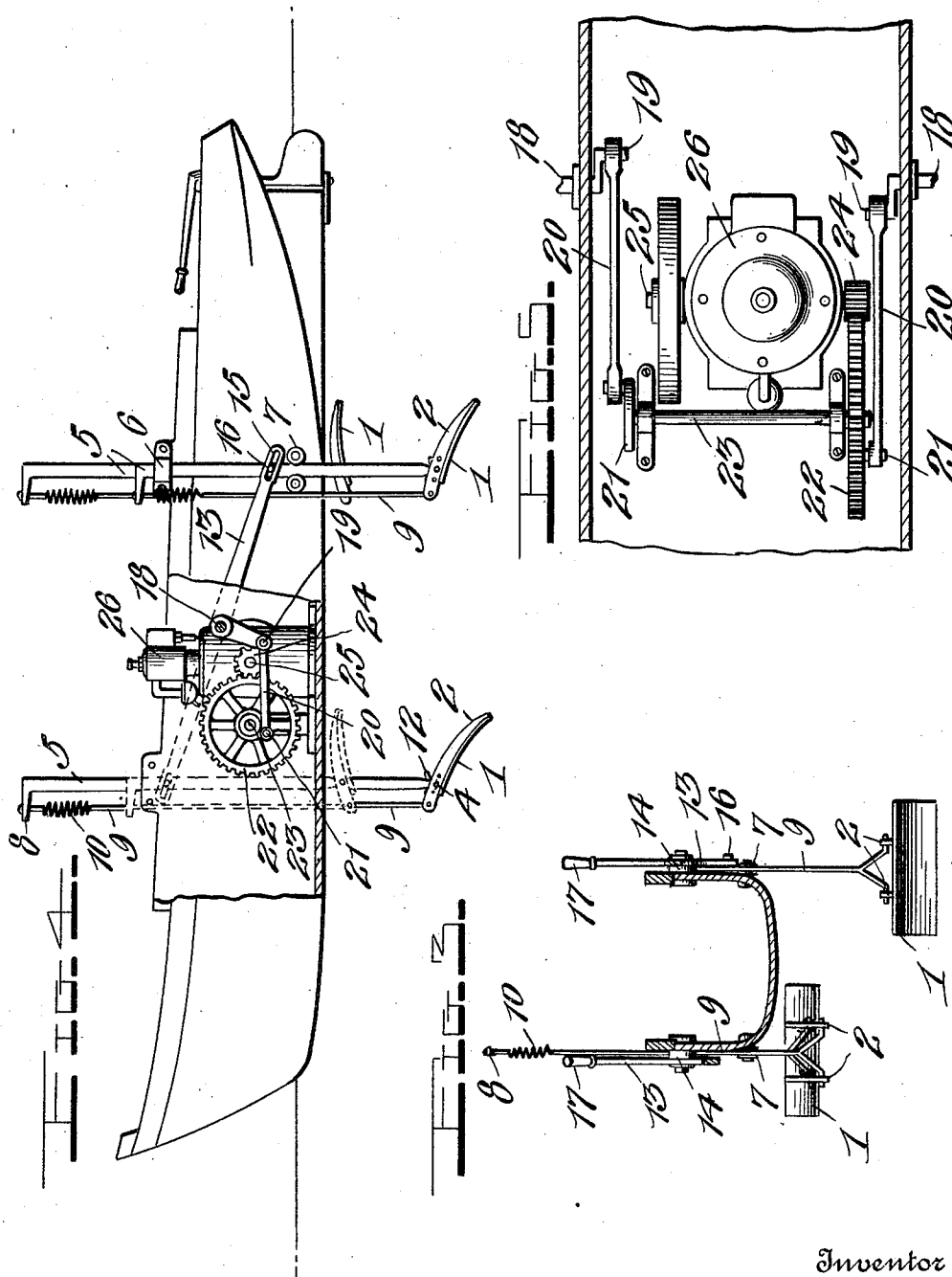
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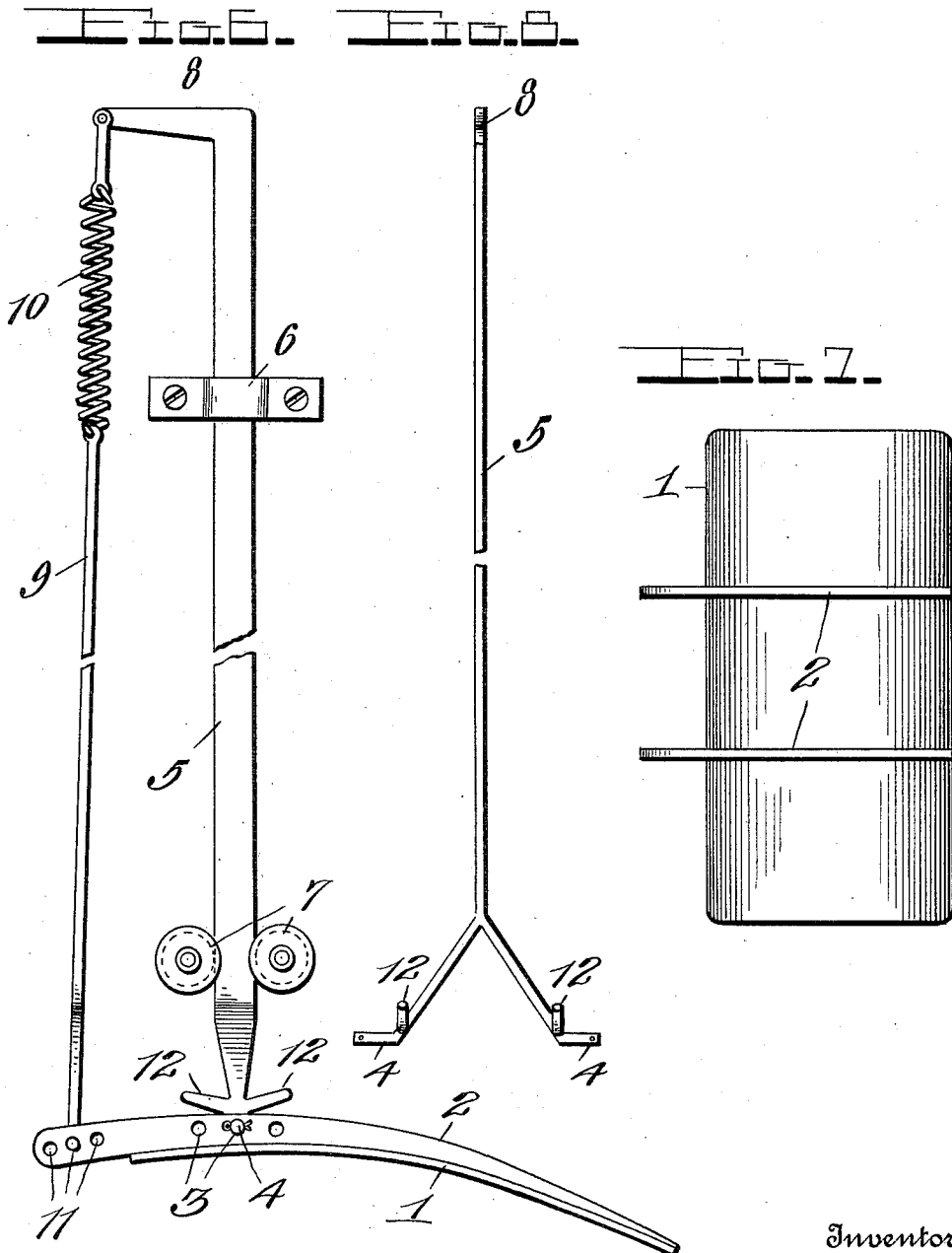
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3 SHEETS-SHEET 3.



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GEORGE R. NAPIER, OF MACON, GEORGIA.

PROPELLING APPARATUS FOR BOATS.

1,006,118.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed September 1, 1910. Serial No. 579,983.

To all whom it may concern:

Be it known that I, GEORGE R. NAPIER, a citizen of the United States, residing at Macon, in the county of Bibb and State of Georgia, have invented certain new and useful Improvements in Propelling Apparatus for 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.

This invention relates to improvements in propelling devices for boats.

One object of the invention is to provide an improved construction and arrangement of propelling devices and means whereby the same are operated to exert a lifting action on the boat simultaneously with the propelling action whereby the head resistance to the boat is reduced to a minimum and the forward movement greatly accelerated.

Another object is to provide a propelling mechanism of this character which may be applied to both power and manually operated boats.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings; Figure 1 is a side view of a boat showing the application of my improved propelling mechanism arranged for manual operation; Fig. 2 is a top plan view of the same; Fig. 3 is a cross sectional view of the same on line 3—3 of Fig. 2; Fig. 4 is a side view of a boat showing the application of the invention with the parts constructed and arranged for operation by suitably applied power, parts of the boat being broken away to illustrate the application of the power; Fig. 5 is an enlarged top plan view of the central portion of the boat and the motor shown in Fig. 4; Fig. 6 is an enlarged side view of one of the propelling blades and its supporting and operating bar; Fig. 7 is a top plan view of one of the propelling blades or paddles; and, Fig. 8 is a front view of one of the supporting and operating bars for the blades or paddles.

In the embodiment of the invention I provide a plurality of "hydroplane" propelling blades or paddles 1, which are preferably constructed in the form of slightly curved

oblong or rectangular shaped blades, to the upper side of which are secured upwardly projecting transversely disposed ribs 2, the forward ends of which project a short distance beyond the forward edges of the blades. The ribs 2 have the same curvature as the blades and said ribs taper or are inclined from the front toward the rear end of the same. In the ribs 2 near the front edges of the blades are formed a series of alined pivot holes 3 with which are pivotally engaged laterally projecting studs 4 formed on the bifurcated lower ends of blade or plane supporting and operating bars 5 which are arranged adjacent the opposite sides of the boat and are slidably mounted in suitable guides 6 secured to the sides of the boat at its upper edge and between pairs of guide rollers 7 revolubly mounted on the sides of the boat near the water line as shown.

The bars 5 have formed on their upper ends right angularly projecting lugs 8 to which are connected the upper ends of plane or blade retracting rods 9 in which are arranged coiled retracting springs 10, the pressure of which is exerted to swing the rear edges of the blades or planes downwardly. The lower ends of the rods 9 are adjustably connected to the forward ends of the ribs 2 by means of a series of pivot holes 11 formed in said ends of the ribs. By means of the adjustable connections between the ribs 2 of the planes or blades and the operating bars 5, and rods 9 the ratio of leverage between the pressure of the water and the tension of the springs may be changed or adjusted. On the lower ends of the supporting and operating bars 5 of the blades are formed forwardly and rearwardly projecting upwardly inclined stop lugs 12 which are provided to limit the pivotal or swinging movement of the blades when the latter are operated.

In Figs. 1, 2 and 3 of the drawings, the boat is shown as being equipped with four hydroplane or propelling blades, two of which are arranged on each side of the boat at the front and rear of the center of the same. The blades or planes shown in these figures are arranged for manual operation or hand power and for the operation of the planes in this manner are provided pairs of operating levers or walking beams 13 which are pivotally mounted midway between their ends in suitable bearing brackets 14 se-

cured to the opposite sides of the boat. On the opposite ends of the levers 13 are formed slotted heads 15 which are engaged with the connecting studs 16 secured to and projecting from the sides of the supporting and operating bars 5 as shown. Formed on or secured to the levers or walking beams 13 are centrally disposed upwardly projecting operating handles 17 the upper ends of which project above the upper edge or gunwale of the boat and are in position to be grasped by the operator whereby the levers 13 may be rocked, thus reciprocating the blade or plane supporting and operating bars 5 which will impart a vertical or up and down movement to the blades or planes 2 which movement of the blades will propel the boat. In thus propelling the boat the walking beams or levers 17 are operated or rocked in opposite directions so that when the front plane or blade on one side of the boat is descending, the other plane on the same side of the boat is ascending, and at the same time, on the opposite side of the boat the front plane is ascending while the rear plane is descending. The effect of this operation will be to keep the boat on an even keel and to avoid any side thrusts. The tendency of the springs 10 in the rods 9 is to keep the rear edge of each plane lower than the front edge, but when the plane is forced to descend the action of the water thereon will have the effect of stretching the spring until the plane tips up at the rear edge until it reaches a point where the upward pressure of the water will be equal to the resisting pull of the spring. When a plane or blade has reached its lowest point and the direction of its movement is reversed, the spring immediately acts to automatically pull the forward edge of the plane upwardly.

Assuming that the boat is moving in a forward direction at a fixed rate of speed with the walking beams in a horizontal and fixed position, then each of the planes will offer the same resistance to the forward motion of the boat and will exert the same pressure upwardly, provided the tension of the springs is the same. If, then, the walking beams be released and a certain amount of force applied thereto so as to cause one of the planes to descend, it will automatically feather, tipping up at the rear edge and driving the boat forward. The up-going plane will be tilted in the opposite direction so that the pressure of the water will be exerted downwardly, the water flowing from the blade and imparting a forward motion thereto.

In Figs. 4 and 5 of the drawings, the walking beams or levers 13 are shown as being fixedly mounted on the outer ends of short crank shafts 18 which are revolubly mounted in suitable bearing sleeves ar-

ranged in the opposite sides of the boat as shown. On the inner ends of the crank shafts 18 are arranged short cranks 19 which are connected by pitman rods 20 to the crank 21 and crank gear 22 arranged on the opposite ends of a counter shaft 23 revolubly mounted in suitable bearings in the boat. The crank gear 22 is in operative engagement with a drive pinion 24 fixedly mounted on the adjacent end of the drive shaft 25 of a suitable motor 26 which is here shown as a gas engine. By thus connecting the walking beams or levers 13 with the motor, said levers will be actuated and the motion thereof imparted to the blade supporting and operating bars, thus reciprocating the propelling planes or blades in the manner hereinbefore described. By operating the planes or blades in the manner described, they will exert a lifting effect on the boat during the descending stroke thus propelling the vessel in a forward direction at the same time that it is lifted. In thus lifting the boat the same will be raised almost if not entirely out of the water, thereby reducing the head resistance and friction to a minimum. As herein shown and described the principle involved in my invention may be applied to both manually and power operated boats and it will also be understood that the invention may be applied to boats or vessels of any size and style.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims.

Having thus described my invention, what I claim is:

1. A propelling mechanism for boats comprising vertically disposed slidably mounted bars having forked lower ends and provided at the extremities of the forks with oppositely disposed upwardly inclined stop lugs, propelling blades pivoted to said forked ends and adapted to swing against said lugs, means for reciprocating said bars, and means for tilting the blades as the bars are reciprocated.

2. A propelling mechanism for boats comprising a plurality of propelling blades, vertically disposed supporting bars pivotally connected at their lower ends to said blades, means whereby said bars are slidably connected to the sides of the boat, spring blade retracting rods connected at their lower ends to the forward edges of said blades and at their upper ends to said bars whereby when the latter are forced downwardly the rear

ends of the blades will be swung upwardly by the pressure of the water against the spring pressure of the rods, and whereby when said bars are drawn upwardly, said
5 spring rods will move the blades downwardly or in a reverse direction, and means whereby said bars and blades are reciprocated.

3. In a propelling mechanism for boats, a
10 series of vertical blade operating bars slidably mounted on the opposite sides of the boat, a series of propelling blades pivotally connected to the lower ends of said bars, blade retracting rods connected to the forward edges of said blades and to the upper
15 ends of said bars, retracting springs arranged in said rods, a pair of walking beams pivotally mounted on the opposite sides of the boat and connected at their outer ends to
20 said blade propelling bars, and means whereby power is applied to said walking beams for the purpose of reciprocating said bars and propelling blades.

4. In a propelling mechanism for boats, a series of vertical blade operating bars slidably mounted on the opposite sides of the
25 boat, a series of propelling blades pivotally connected to the lower ends of said bars, blade retracting rods connected to the forward edges of said blades and to the upper
30 ends of said bars, retracting springs arranged in said rods, a pair of walking beams pivotally mounted on the opposite sides of the boat and connected at their outer ends to
35 said blade propelling bars, and handles arranged on said walking beams whereby the same may be manually operated to reciprocate said bars and propelling blades.

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

GEORGE R. NAPIER.

Witnesses:

C. E. HARRIS,
J. E. KING.

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