June 17, 1969 L. LIPPINCOTT 3,450,089

WHEEL DRIVEN BOAT

Filed Aug. 15, 1967 Sheet 1 of 2

Fig. 1.

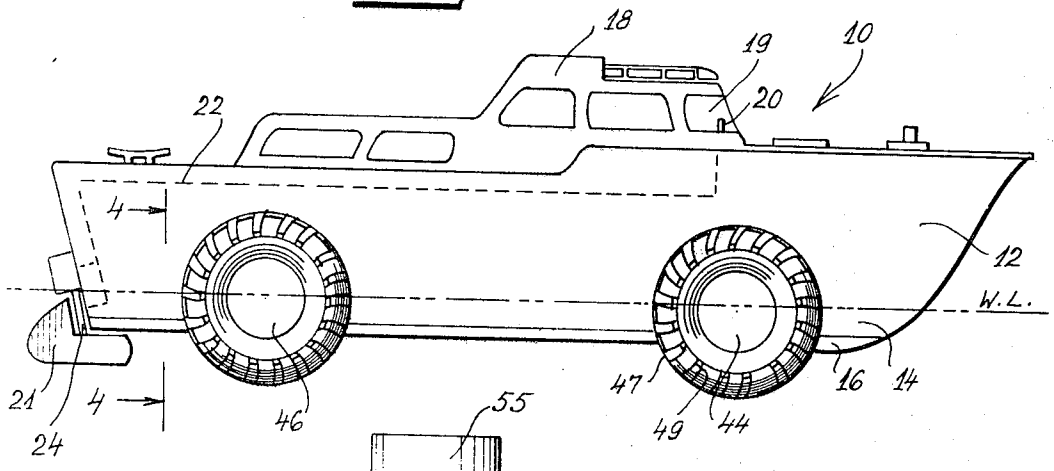


Fig. 2.

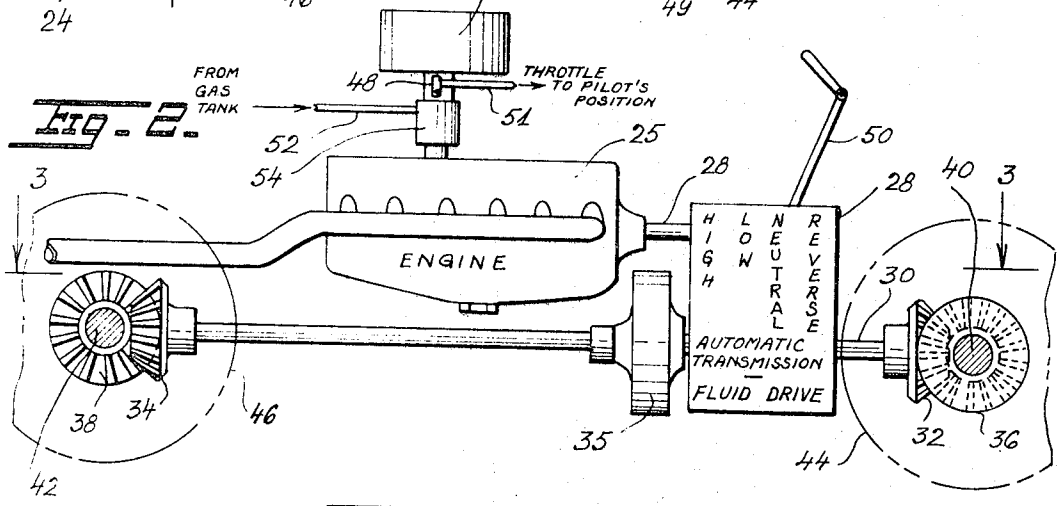


Fig. 3.

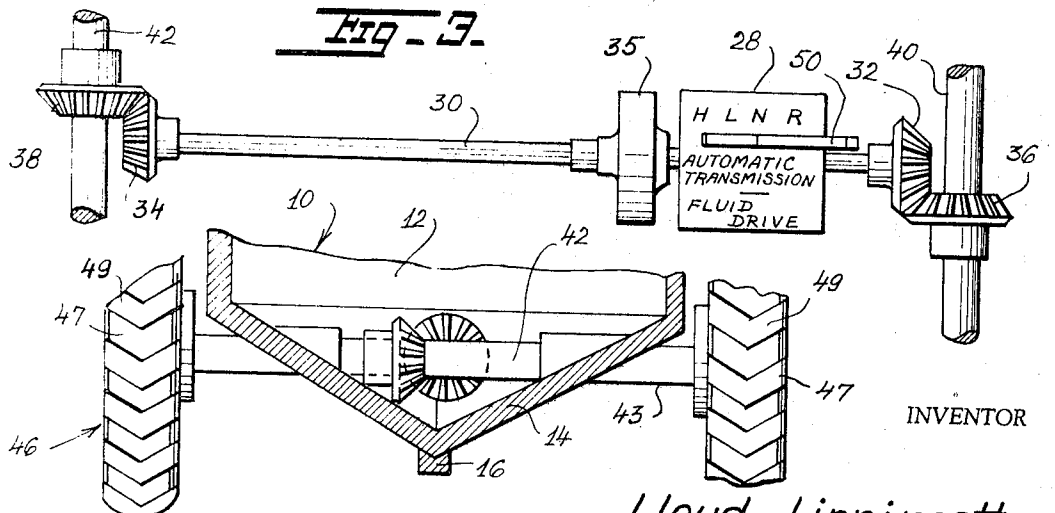


Fig. 4.

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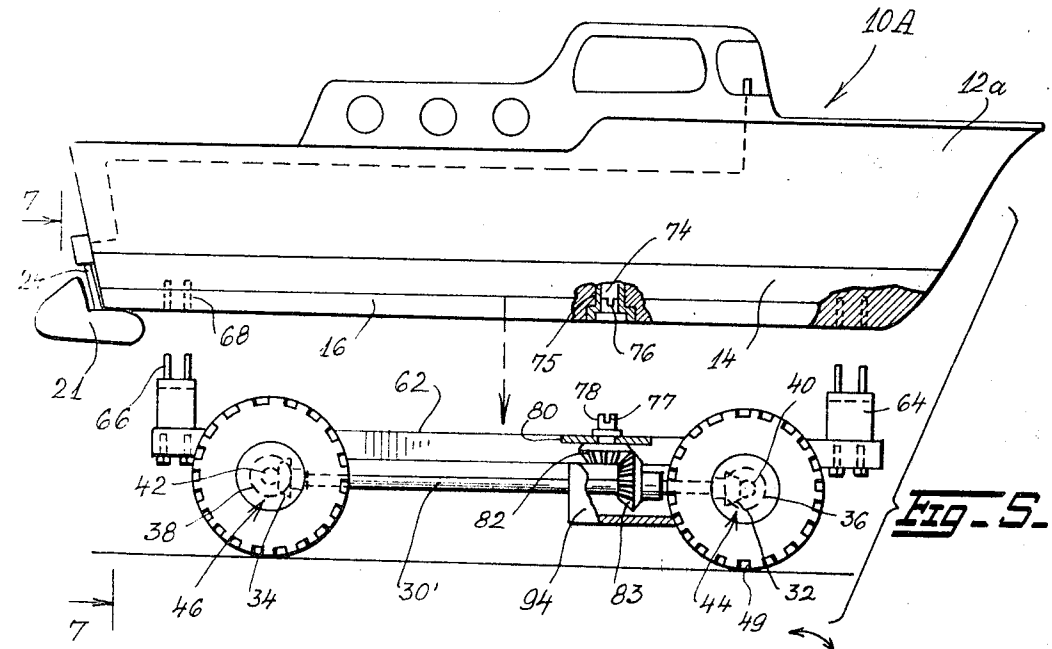


Fig - 5

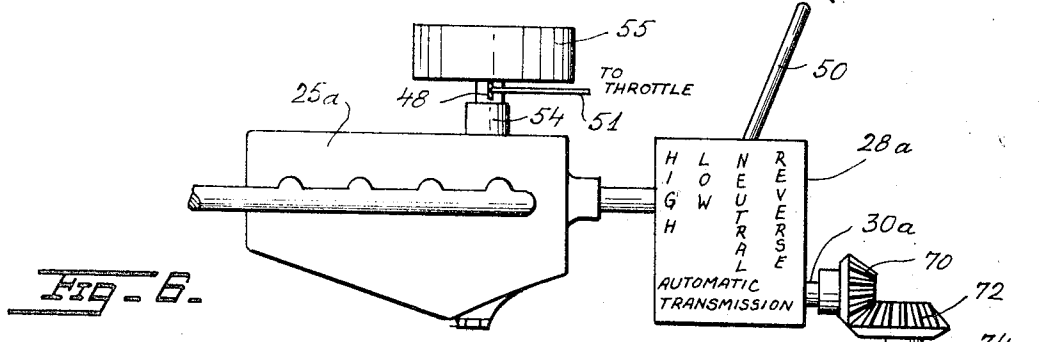
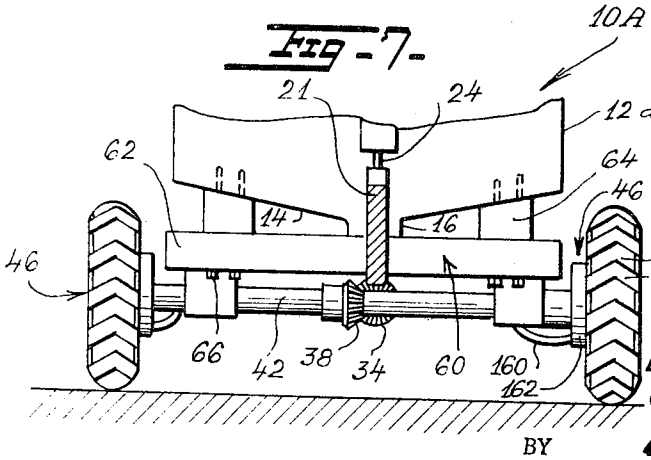


Fig - 6

Fig - 7



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WHEEL DRIVEN BOAT

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U.S. Cl. 115—1
5 Claims

ABSTRACT OF THE DISCLOSURE

The disclosure describes a boat having a four-wheel drive. The wheels have deep treads which effectively drive the boat through the water. The wheels can be mounted on a carriage which can be attached to the boat. The wheels can be steerable so that the boat can be driven on land.

The invention is directed at a boat having four pneumatic wheels all driven by an engine in a boat. According to the invention, the wheels can be steered and braked under control of the pilot on deck.

One object of the invention is to provide a boat with four engine driven wheels.

Another object is to provide an amphibious boat with four engine driven wheels and means for steering and braking the front wheels under control of the pilot of the boat.

A further object is to provide a boat with a separable carriage having four wheels mounted thereto.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIGURE 1 is a side view of a boat embodying the invention.

FIG. 2 is a fragmentary enlarged side view of the engine of the boat and associated parts.

FIG. 3 is a plan view taken on line 3—3 of FIG. 2.

FIG. 4 is an enlarged vertical sectional view of part of the boat taken on line 4—4 of FIG. 1.

FIG. 5 is an exploded side view of another boat with detached wheel carriage.

FIG. 6 is a side view of the engine and associated parts of the boat of FIG. 5.

FIG. 7 is a fragmentary rear view taken on line 7—7 of FIG. 5, with the boat and wheel carriage assembled.

FIG. 8 is a fragmentary side view of a boat similar to that of FIG. 5, provided with a wheel carriage having steered and braked wheels.

FIG. 9 is a fragmentary top view on an enlarged scale of the wheel carriage of FIG. 8.

FIG. 10 is a fragmentary vertical sectional view on a further enlarged scale taken on line 10—10 of FIG. 9.

FIG. 11 is a top perspective view of a boat embodying still another modified form of the invention.

FIG. 12 is a bottom plan view thereof.

FIG. 13 is a front elevational view thereof.

Referring first to FIGS. 1–4, there is shown a boat **10** having a hull **12**. The hull has inclined bottom walls **14** meeting at the bottom to define a keel **16**. The boat has a cabin **18** on top with a forward pilot's position **19** where hand controls **20** are located. At the stern of the boat is a rudder **21** operatively connected by means **22** indicated in dotted lines in FIG. 1. The connection means **22** can be flexible cables, or other suitable means for turning the rudder on its shaft **24**. To the extent described, the boat **10** is conventional.

Now according to the invention the boat has an inboard engine **25** which can be an internal combustion engine. The engine has an output shaft **26** connected to an automatic transmission assembly **28** of conventional fluid drive construction having high gear, low gear, neutral, and reverse positions. The transmission assembly **28** has an output shaft **30** provided with bevel gears **32**, **34** at opposite ends and carrying flywheel **35**. The shaft **30** extends longitudinally of the boat. Gears **32**, **34** are engaged with forward and aft reversely oriented gears **36**, **38** mounted to shafts **40**, **42**. These transverse shafts are journaled in horizontal sleeve **43** extending through bottom walls **14** of the hull. The shafts **40** and **42** carry pairs of wheels **44**, **46** at opposite ends. The wheels have pneumatic tires **47** with deep angled cleats **49** which act like vanes when the wheels are rotated. The planes of the wheels extend longitudinally of the hull on opposite sides thereof.

The engine is controlled by a throttle lever **48** having linkage **51** terminating at the pilot's position **19**. Linkage **50** which controls the transmission assembly **28** also terminates at the pilot's position **19**. Fuel such as gasoline is conveyed by fuel line **52** from a fuel tank (not shown) to carburetor **54** on the engine. An air filter **55** is mounted above the throttle and carburetor.

In operation of boat **10**, the boat will be steered by turning rudder **21** angularly when a hand control **20** is turned. When the engine is turned on and the transmission is shifted from neutral to low or high gears, the wheels will all turn in the same direction and the boat will move forwardly. Speed of the wheels and of forward movement of the boat will be controlled by the hand or foot operated throttle linkage **51**. When the transmission **28** is shifted to reverse position the direction of rotation of the wheels will be reversed and the boat will move to the rear.

In FIGS. 5–7 is shown another boat **10A** in which parts corresponding to boat **10** are identically numbered. In this boat the hull **12***a* is mounted to separable wheel carriage **60**. The wheel carriage **60** has a horizontal rectangular frame **62** provided with slanted blocks **64** at opposite ends for abutting the inclined bottom walls **14** of the hull. Bolts **66** extend into threaded holes **68** in the bottom of the hull to secure the carriage of the hull.

Engine **25***a* of boat **10A** is mounted in the hull and drives fluid drive automatic transmission assembly **28***a*. This assembly has an output shaft **30***a* carrying a drive gear **70**. Gear **70** is meshed with a gear **72** on a stub shaft **74** journaled in a bearing **75** at the bottom of the hull. The bottom end of shaft **74** has a key **76** which engages in slot **77** at the upper end of a stub shaft **78**. Stub shaft **78** is journaled in a transverse bearing plate **80** mounted at the top of the carriage frame. When the hull is properly mounted on the carriage the shafts **74** and **78** will be engaged so as to rotate together. Stub shaft **78** carries gear **82** which is meshed with gear **83** secured to longitudinal horizontal drive shaft **30'**.

Drive shaft **30'** has gears **32** and **34** at opposite ends meshed with gears **36**, **38** of cross shafts **40**, **42**. The shafts **40**, **42** carry wheels **44**, **46** on which the tires **47** with deep cleats **49** are formed. A housing **94** can be provided at the bottom of the carriage frame to enclose the gears **82**, **83**.

The wheel carriage **60** can be attached to the hull **12***a* in drydock, or the wheel carriage can be pushed down to the shore and then floated underneath the hull. There the bolts **66** will be secured. It will be noted that the carriage **60** will be bouyant because the frame **62** can be made of wood and the air filled tires **47** will be bouyant. Thus the carriage does not tend to drag the hull down. The assembled hull and wheel carriage operates in the same manner as described above, in connection with boat **10**, in forward and reverse drive connections.

What is claimed is:

1. A boat, comprising a hull having a pilot's operating position on top and a closed bottom, an engine inside the hull, a first pair of wheels rotatably mounted on op-

posite sides of the hull near its front end, a second pair of wheels rotatably mounted on opposite sides of the hull near its rear end, pneumatic tires with deep, angled cleats extending circumferentially round the tires, a transmission assembly coupled to the engine, mechanical means operatively connecting all the wheels to the transmission assembly so that all the wheels rotate in the same direction simultaneously when the engine is running and when the transmission assembly is in gear, and controls at the pilot's position operatively connected to the engine and transmission assembly for operating the same, said wheels all rotating on axes perpendicular to the longitudinal fore and aft direction of the hull, whereby the boat is driven forward and backward while floating in water and while on land when the engine is running and when the transmission assembly is in gear, a wheel carriage having a generally rectangular buoyant frame, said wheels being rotatably carried on opposite sides of the frame, and means detachably securing the frame of the hull.

2. A boat as recited in claim 1, further comprising a pair of shafts carried by said frame and extending transversely of the hull, said shafts rotatably supporting the wheels, a drive shaft supported by the frame and extending longitudinally of the hull, gear means coupling said drive shaft to the pair of transverse shafts, said mechanical means comprising a pair of stub shafts detachably coupled to each other and respectively coupled to said gear means and transmission assembly, one of said stub shafts being journaled in the bottom of the hull and the other stub shaft being journaled on the frame, whereby said wheel carriage can be separated from the hull, and

whereby the wheel carriage can be attached to the hull so that the transmission assembly is operatively coupled to the wheels to drive the same.

3. A boat as recited in claim 1, further comprising universal joints pivotably attaching the front pair of wheels to one of the transversely disposed shafts, a steering control at the pilot's position, and further mechanical means operatively connecting said steering control to the front wheels whereby the boat can be steered while in the water and on while on land.

4. A boat as recited in claim 3, further comprising braking means carried by the frame and engageable with the wheels to stop rotation thereof, a braking control at the pilot's position, and other means operatively connecting said braking control with said braking means for actuating the same.

5. A boat as recited in claim 3, wherein said further mechanical means and said other means both comprising separable engaged members so that the wheels can be detached from the hull.

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