May 5, 1964 D. W. SESSIONS 3,131,666

MARINE CRAFT INCLUDING AMPHIBIOUS CRAFT

Filed June 20, 1962 3 Sheets-Sheet 1

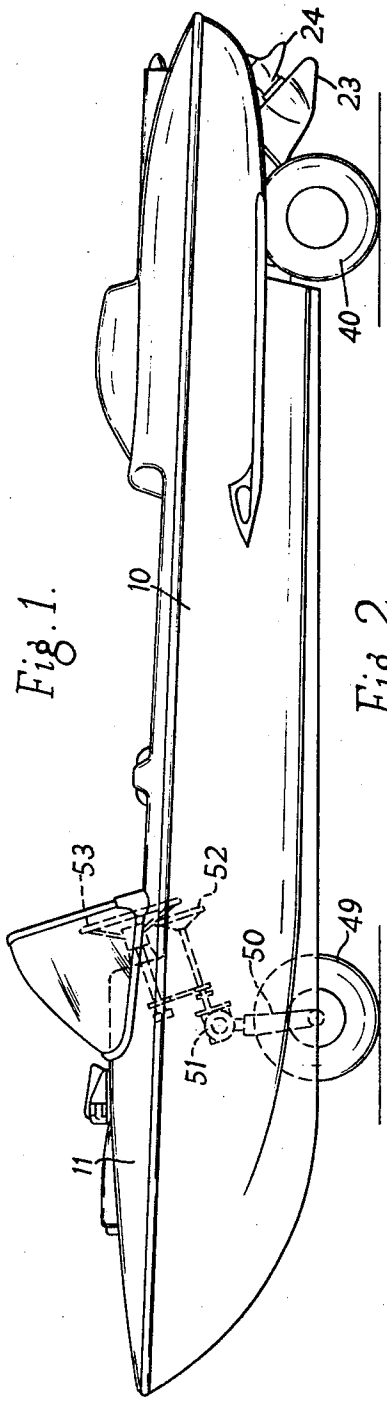


Fig. 1.

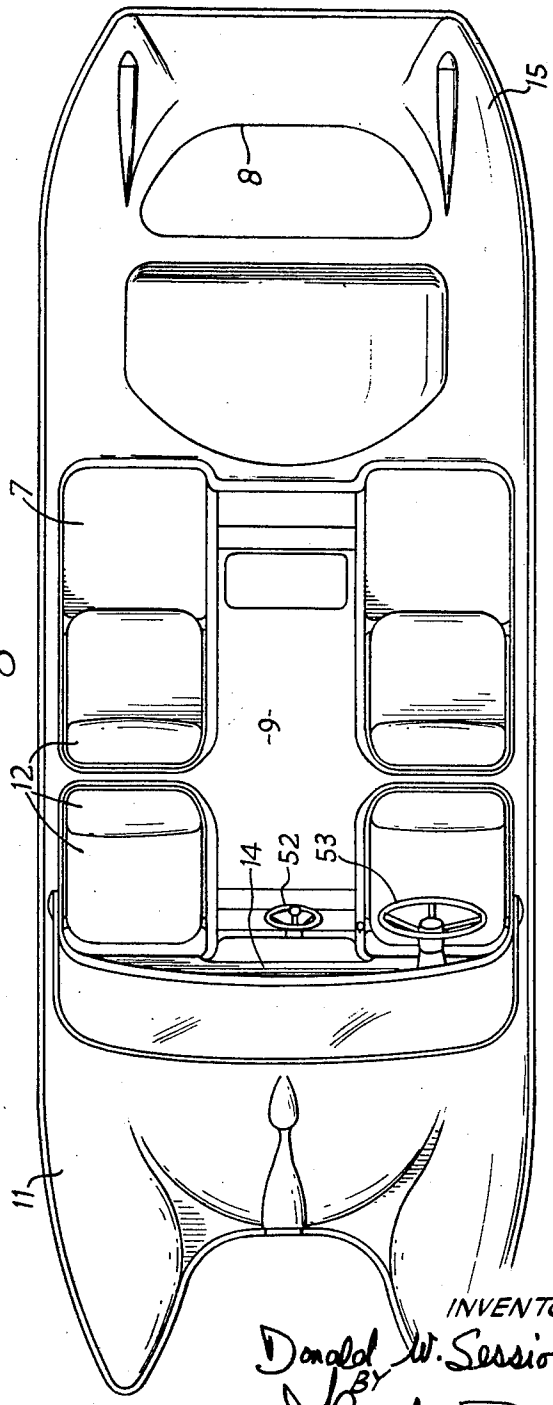


Fig. 2.

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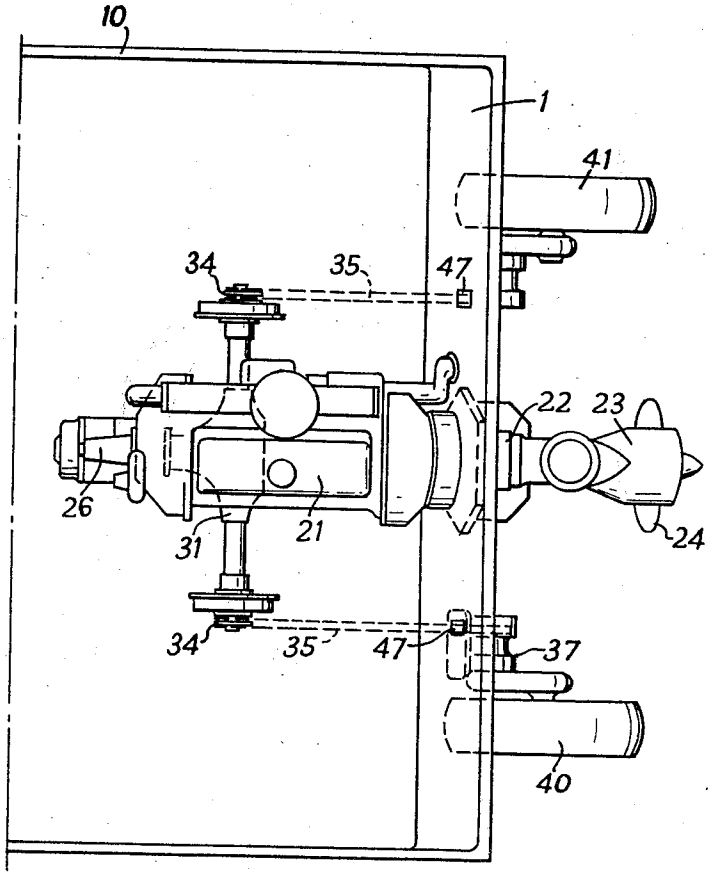
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Fig. 3.



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Fig. 4.

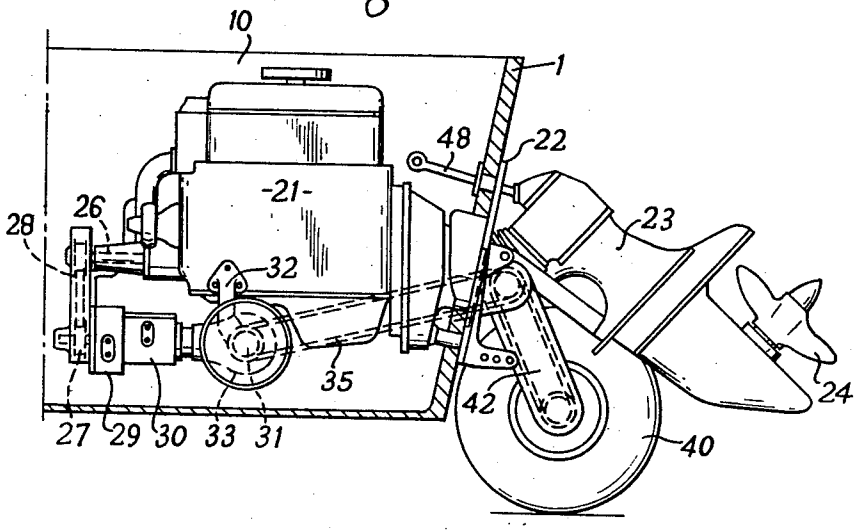
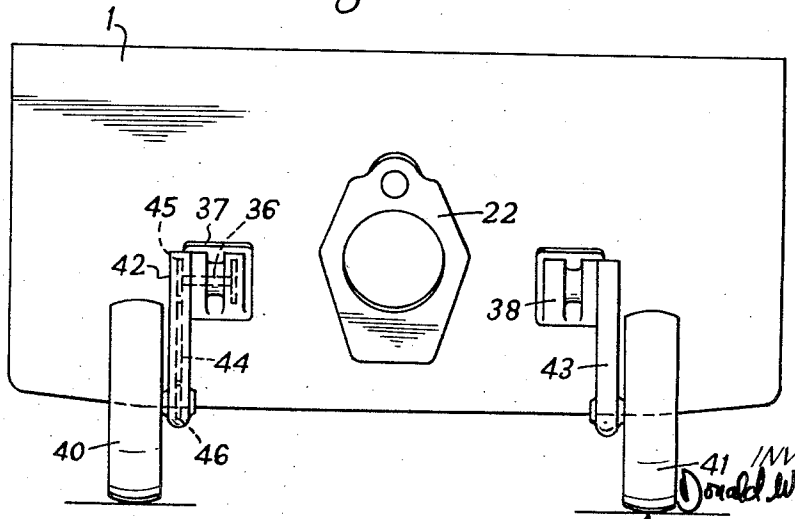


Fig. 5.



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MARINE CRAFT INCLUDING AMPHIBIOUS CRAFT

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Claims priority, application Great Britain July 7, 1961
2 Claims. (Cl. 115—1)

This invention relates to marine craft including amphibious craft, that is, craft which can be propelled both on land, and in the water.

There are known amphibious craft which are provided with undercarriages for self-propelled movement on land, and propulsion means for movement in the water. The common disadvantage of known craft of this type is the inability to obtain a satisfactory power drive to the road wheels from the same power unit or prime mover providing power to the propeller. The unavoidable detachability of known outboard propelling units renders any sort of permanent drive for the road wheels impracticable.

According to the invention, there is provided a marine craft comprising a hull including a rear transom, a prime mover supported by the transom on the inside of the hull, said prime mover having a crankshaft disposed longitudinally of the craft, a propeller unit mounted on the transom on the outside of the hull, a transmission device comprising clutch, gearbox and transverse axle, located substantially below the bottom of the prime mover, said transmission device being carried by the prime mover and transom.

The invention also includes an amphibious craft comprising a hull including a rear transom, fore and aft road wheels, the aft road wheels being mounted on the transom at the rear thereof on a transverse axis about which they are retractably movable, a propeller device mounted on the transom at the rear thereof on a transverse axis about which it is retractably movable, a prime mover mounted on the transom on the inside of the hull and drivably connected through the transom with the propeller, a transmission device comprising a clutch gearbox and transverse axle, located substantially below the bottom of the prime mover, said device being carried by the prime mover and transom, and driving means for drivably connecting said device with the road wheels.

The invention will now be described, by way of example, with reference to the accompanying drawings, wherein:

FIGURE 1 shows a side view of a catamaran craft designed in accordance with the invention having a hull body and a deck body, with the undercarriage extended for movement of the craft on land;

FIGURE 2 shows a plan view of the craft illustrated in FIGURE 1;

FIGURE 3 is a plan view on a larger scale with the deck removed;

FIGURE 4 is a sectional view of the rear part of the hull with the propeller device and road wheels; and

FIGURE 5 is a rear end view of FIGURE 4 with the propeller device omitted.

The hull body 10 is a fibre-glass moulding incorporating a laminated bonded transom member 1 securely moulded in position, and capable of withstanding the heavy stresses imposed on this member. The hull is formed to have good planing characteristics at the appropriate speed.

The body deck 11 is also a fibre-glass moulding. It has a flange matching the flange on the hull body 10. The deck body includes integral fore and aft turtle decks, the aft turtle deck being provided with a motor access hood opening 7 and an aft gear access hood opening 8. The

deck body is formed with a centre well deck 9, and is provided with seat pans and back mouldings 12, instrument panel 14 and other necessary fittings such as housing navigation lights and brake lights.

The stern cover 15 is formed of moulded fibre-glass, and is stuck, or otherwise connected, to the lower side of the deck body and transom by a detachable flange joint.

A gasoline or diesel prime mover 21 is fixed to the transom 1 by means of a flange plate 22 to which also is pivotally mounted a propeller device 23. The engine is located within the hull forwardly of the transom with its crankshaft longitudinally of the craft and the propeller is aft of the transom. The crankshaft of the engine extends through the transom and drives the propeller 24. The propeller device 23 is mounted on a horizontal transverse spindle so that it can be retracted when the road wheels are in use.

At the forward crankshaft end opposite to the propeller shaft mount, a crank shaft extension shaft 26 is secured which drives a counter shaft 27 which is disposed longitudinally of the craft, the drive being effected by a chain or gearing belt 28. The shaft 27 drives a transmission device consisting of a clutch 29, gearbox 30 and transverse axle 31, the latter having an axle case rigidly mounted on brackets or arms 32 fixed to and depending from the engine 21. The axle 31 is provided on each end with a brake mechanism 33 and a driving sprocket 34. Chains 35 transmit power from the sprockets 34 to horizontal spindles 36, these chains extending through apertures 47 in the transom 1. The spindles 36 are housed in wheel support brackets 37, 38 mounted on the transom 1 at the rear thereof. Rear road wheels 40, 41 have their axles mounted in the lower ends of arms 42, 43 which house chains 44 that transmit drive from sprockets 45 on the spindles 36 to sprockets 46 to the wheel axles. The upper ends of the arms 42, 43 are pivotally mounted on the horizontal spindles 36 so that the arms can be moved pivotally for retracting the wheels and moving down to the road engaging positions. Worm gearing or other means may be provided for operating the arms 42, 43.

The water propelling device 23 is pivotally mounted on the transom 1 so that it can be raised for travel on land, or lowered for travel through water. It is pivotable to right or left by a steering member 48.

At the forward end of the boat a road wheel 49, or two such wheels if desired, is mounted so as to be freely rotatable on a forked arm support 50 which is pivoted to be retracted or lowered as desired on trunnions 51. The arm 50 is retracted or lowered as desired by a handwheel 52. The steering wheel 53 is also coupled to the arm 50, reduction gearing and bevel gears mounted within the trunnions for pivoting the arm 50 for steering by means of the wheel 53.

The retraction or lowering of all three road wheels may be controlled simultaneously from the driver's seat by sprocket and chain or shafting from the handwheel 52 in front of the driver, coupled to the trunnions connected to the wheel support arms 50 and 42, 43. In addition the manual control can be power operated either electrically or hydraulically. The retractable outboard water propelling device 23 may also be synchronised with this control to provide for this to lift above ground level when the wheels are lowered, and vice versa. When the road gear or the outboard propelling member is retracted, it is positioned entirely above the water level or ground level respectively.

A craft designed in accordance with this invention has the advantages firstly that the underwater lines of the hull or hulls, as in the case of a catamaran, are not impaired by any obstructions when the road gear is retracted, thus providing the full performance of the craft on the

water normally expected from a non-amphibious craft, and secondly that all the transmission means, including brakes and controls, are protected from the water, these being mounted within the hull's shell or in watertight casings, as in the case of the retractable support arms carrying the wheels. When the wheels are fully retracted, no mechanical part thereof is below the water line of the craft. Furthermore the engine and transmission are permanently mounted in a convenient position within the hull and operating the propeller and rear road wheels outside the hull.

I claim:

1. An amphibious craft comprising a hull including a rear transom, fore and aft road wheels, a pair of arms each pivoted at one end to the transom at the rear thereof, the other ends of these arms carrying the aft road wheels rotatably, whereby the arms can be pivoted to bring the road wheels above the water line, a propeller, a mounting device for the propeller, one end of said mounting device being pivoted to the rear of the transom, the other end of said mounting device carrying the propeller, whereby the mounting device can be pivoted to bring the propeller above the water line when the craft is required to travel on land and to bring the propeller below the bottom of the hull when the craft is used in water, an engine mounted in the hull adjacent the transom, said engine having a crankshaft, the rear end of said crankshaft extending through the transom and being drivably connected to the propeller, said crankshaft also extending forwardly of the engine, two rotary means mounted on the transom at the rear thereof adjacent the upper ends of said arms, driving means carried by said arms for transmitting drive from said rotary means to said road wheels, and transmission means extending below the engine and extending through the transom and transmitting drive from the forward end of the crankshaft to said rotory means.

2. An amphibious craft comprising a hull including

a rear transom, fore and aft road wheels, a pair of arms each pivoted at one end to the transom at the rear thereof, the other ends of these arms carrying the aft road wheels rotatably, whereby the arms can be pivoted to bring the road wheels above the water line, a propeller, a mounting device for the propeller, one end of said mounting device being pivoted to the rear of the transom, the other end of said mounting device carrying the propeller, whereby the mounting device can be pivoted to bring the propeller above the water line when the craft is required to travel on land and to bring the propeller below the bottom of the hull when the craft is used in water, an engine mounted in the hull adjacent the transom, said engine having a crankshaft, the rear end of said crankshaft extending through the transom and being drivably connected to the propeller, said crankshaft also extending forwardly of the engine, two rotary devices mounted on said transom at the rear thereof adjacent the upper ends of said arms, driving means located inside said arms and conveying drive from said rotary devices to said road wheels, an axle located transversely of the crankshaft below the engine, bracket means attached to the engine and carrying said axle, transmission means transmitting drive from the forward end of the crankshaft to said axle, and chains and sprocket means transmitting drive from said axle to said rotary devices, said chains extending through the transom.

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