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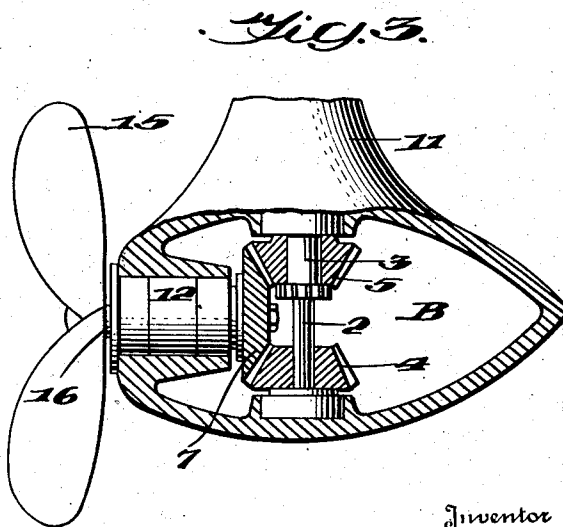
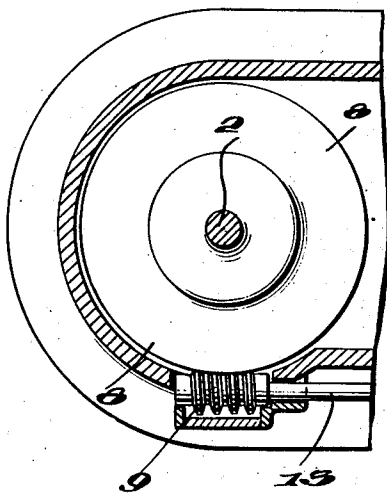
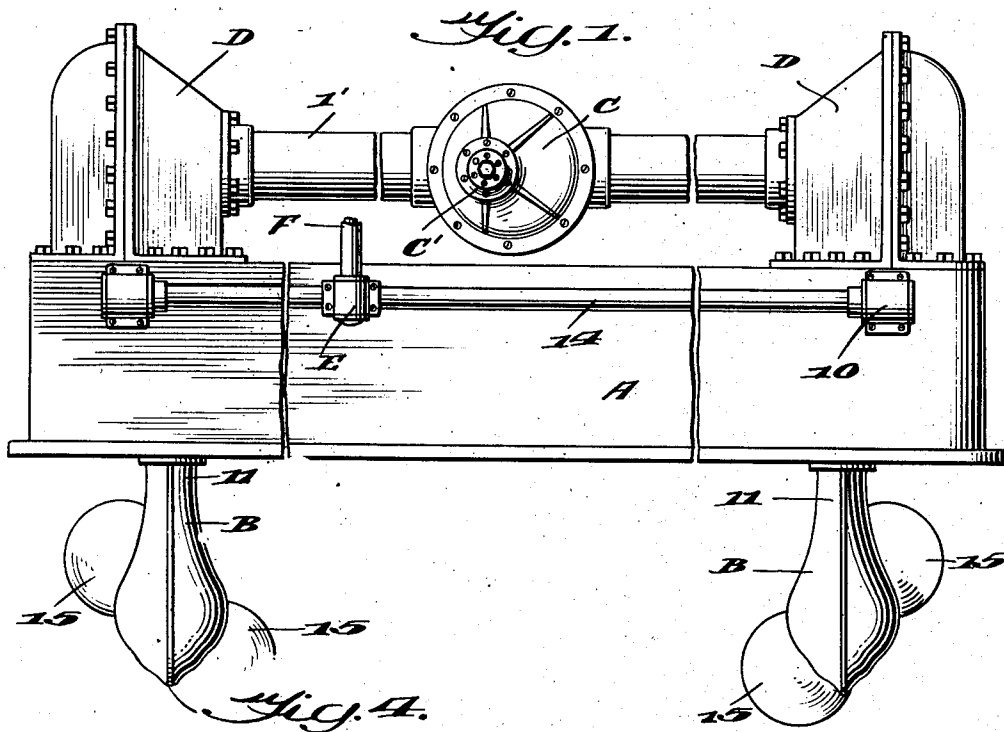
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2,386,362

CONTRA-POSED TWIN TURRETED BOAT AND SHIP DRIVE

Filed Oct. 12, 1942

2 Sheets-Sheet 1



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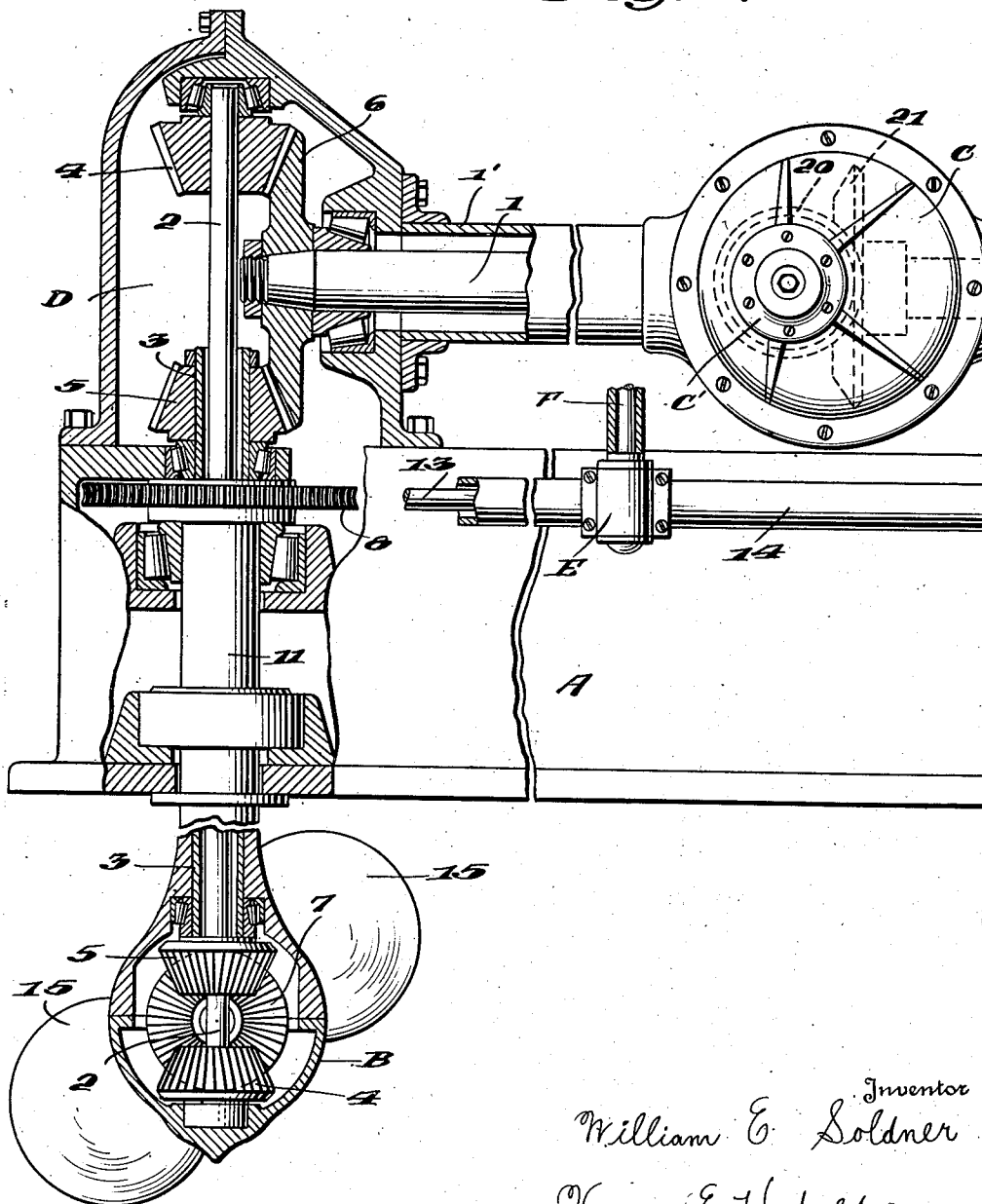
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Fig. 2.



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UNITED STATES PATENT OFFICE

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CONTRAPOSED TWIN TURRETED BOAT AND
SHIP DRIVE

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Application October 12, 1942, Serial No. 461,740

2 Claims. (Cl. 115—35)

My invention relates to an improvement in contraposed twin turreted boat and ship drives.

This drive is intended as a tractor type drive as well as a pusher type, and these drives should be used in pairs although not necessarily, one at the stern and one at the bow of the boat, on the principle that the boat can be pulled with much less power than it can be pushed.

The desideratum is manoeuvrability in crowded bays or on the high seas; directional stability under the most trying weather; safety; greater speed; less pitching and yawing in heavy sea; and facility in docking.

In the accompanying drawings:

Fig. 1 is a view in front elevation showing the propelling mechanism located preferably near the end of the boat at right-angles to the bow or stern;

Fig. 2 is an enlarged fragmentary view of the same partly in vertical longitudinal section;

Fig. 3 is an enlarged detail of the nacelle showing the housed gear and the propeller; and

Fig. 4 is a fragmentary detail in horizontal section showing a worm and worm gear which is, for convenience of illustration, omitted from Fig. 2.

A, represents the twin turret drive base; B, an outboard nacelle of which there are preferably two, one either side of the boat as illustrated in Fig. 1; C is a bell housing; C' is the motor coupler flange; D is the secondary drive group; E is the steering assembly; and F represents the shaft leading to the steering head (not shown).

The numeral 1 is the cross-drive shaft viewed in Fig. 2 and extending across from one drive group D to the other through the tubular casing 1'. 2, is a long jack or countertorque shaft extending from the secondary drive group down and into the outboard nacelle B as viewed in Fig. 2. The numeral 3 is a tubular jack-shaft through which the shaft 2 extends. 4 are upper and lower drive pinions, and these are keyed to the upper and lower ends of the jack or countertorque shaft 2. 5 are drive pinions on the tubular shaft 3. 6 is a secondary drive gear, one of which is shown in Fig. 2 secured on the end of the cross drive-shaft 1. Another similar secondary drive-gear (not shown) is secured on the opposite end of the cross-shaft 1, it being a part of the secondary drive group on the right-hand end of shaft 1, and corresponding to the secondary drive gear 6 shown in Fig. 2. A final drive-gear is indicated by the numeral 7. A turret traversing gear 8, preferably of the worm gear type, which is keyed

or splined to the nacelle post 11 is driven by a worm 9 as shown in Fig. 4. The traversing gear assembly 10 is located at the right in Fig. 1, and is secured on the worm-shaft 13, which shaft extends through the tubular casing 14. 11 is the nacelle post, and 12 the propeller shaft bearing assembly. 15 is a propeller on the outer end of the shaft 16 of this assembly with the final drive-gear 7 on the opposite end of shaft 16. The length and dimensions of the nacelle post 11 may be regulated by the particular design of the boat bottom.

Power input is applied from the motor (not shown) at the motor coupling C'. The power input is transmitted by cross-drive shaft 1, secondary drive gear 6, and drive pinions 4 and 5 on the upper ends of the shafts 2 and 3. Cross-shaft 1 extends directly to the secondary drive-gears 6 at opposite ends of the shaft. Secondary drive-gear 6 on shaft 1 transmits power input thrust to the drive pinions 4 and 5, which in turn receive their thrust from directly opposite rims of the secondary drive-gear 6, thereby equally distributing the input power thrust between the two jack-shafts 2 and 3, on which the drive pinions 4 and 5, respectively, are keyed or splined, and which revolve in opposite directions. These lower pinions 4 and 5 engage final drive gear 7, shown in Figs. 2 and 3, thereby transmitting input power thrust to the final drive gear at two points on its outer rim directly opposite each other. Since these four pinions, two pinions 4 and two pinions 5, revolve in opposite directions, and since they are located at the final extremity of the jack-shafts 2 and 3, their opposed leverage lend to neutralizing conducted torque stress.

It is the double jack-shafts 2 and 3 turning in opposite directions that balance the torque on the nacelle post and make for easy steering. These drives may be used in pairs, but not necessarily so, one near the bow and one near the stern, and the combination of the two will cause the boat to ride higher and with steadier keel under power.

From the foregoing it will be observed that I use one propeller on each drive nacelle, and I balance my final torque strain through the worm drive 13 which couples the twin drives D, and this strain is minimized by gear grouping and single propellers rotating in opposed directions.

The nacelles turn simultaneously in the same direction on each drive unit, steering similarly to the front wheels of an automobile.

Power from the motor (not shown) is transmitted to the cross-drive shaft through the bevel

gears 20 and 21, which latter is keyed on shaft 1.

The nacelles of this twin turret boat and ship drive are constructed to turn freely through 360°. The body of the nacelle preferably should follow the propeller through the water, although special design may require the reverse to be more desirable.

It will be understood that, preferably, one pair of drive groups B through D, as shown in Fig. 1, will be used toward the bow of the boat, and that another pair may be used near the stern. The propellers near the bow are preferably of the tractor type, while those near the stern may be of the pusher type, though not necessarily so.

Bow and stern assemblies should have separate steering heads for each assembly.

Most steering will be done with one bank of two nacelles, the other bank pulling straight ahead.

Combat or killer ships may steer from both sets for rapid changing of course and to stiffen the vessel against being rolled by violent propeller thrust during sharp turns since steering with the stern drive set will cause the vessel to yaw in the direction the vessel is being turned, and steering with the bow drive set will cause the vessel to yaw opposite the direction the vessel is being turned. Thus it may readily be observed that expert handling of this mechanism will prevent small craft from floundering in a deep wake in a heavy sea.

I claim:

1. A contraposed twin turret boat and ship drive including a primary drive shaft and motor coupler means, primary drive gear and pinion, a cross-drive shaft, outboard nacelles, secondary drive gears secured to opposite ends of the cross

drive-shaft, concentric solid and tubular jack-shafts, gears on the upper and lower ends of said shafts to which the secondary drive-gear transmits opposed rotary motion, final drive gears, propeller shafts, propellers adapted to be driven in opposite directions by the cross drive-shaft through said gears, nacelle posts to which the nacelles are connected, gears keyed or splined to these posts, a shaft having gears thereon for transmitting rotary motion to the nacelle posts, and means extending from a steering-head for transmitting rotary motion to the last-named shaft whereby the nacelle posts may be turned axially through any number of degrees up to and including 360°.

2. A 360° contraposed twin turret boat and ship drive including a twin turret drive base, two outboard nacelles rotatably supported thereby, secondary drive groups mounted on the base, a cross-shaft extending to said secondary drive groups, means for driving said shaft, secondary drive gears on the opposite ends of the shaft, rotatable nacelle posts having worm-gears thereon, worms for transmitting rotary motion thereto, concentric shafts constituting a part of the secondary drive groups, pinions secured at opposite ends to said concentric shafts, the secondary drive shafts, the secondary drive-gear arranged to transmit rotary motion in opposite directions to said concentric shafts, steering mechanism for turning the nacelles simultaneously, and rotary propellers supported by the nacelles and the pinions on the concentric shafts located within the nacelles transmitting motion to the propellers.

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