Aug. 9, 1960 G. A. WITT 2,948,254

PROPELLER

Filed Aug. 12, 1959

FIG. 1.

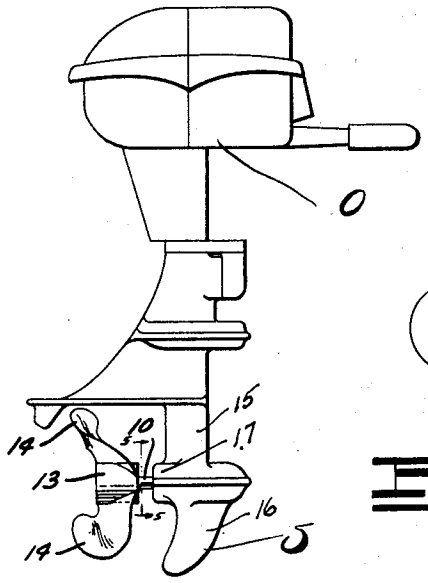


FIG. 2.

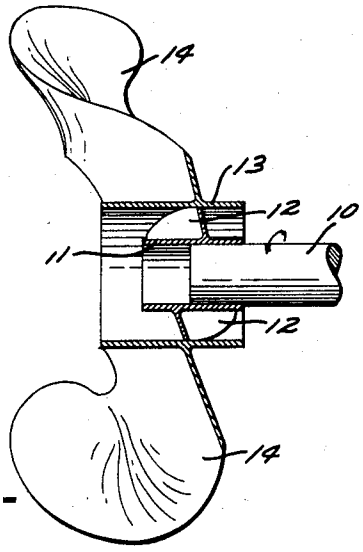


FIG. 5.

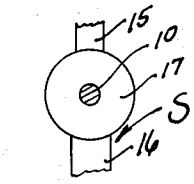


FIG. 3.

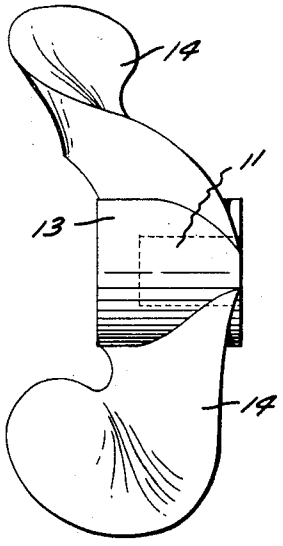
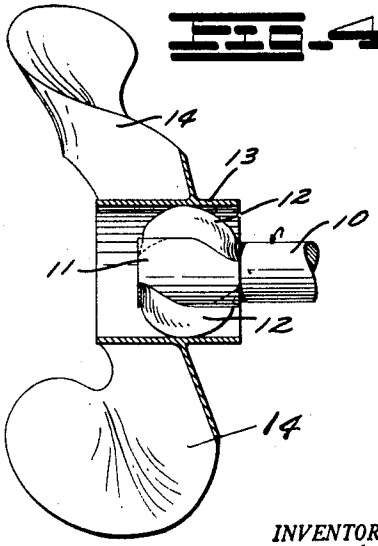


FIG. 4.



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PROPELLER

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2 Claims. (Cl. 115—17)

This invention relates to propellers such as used in connection with power plants of boats and more particularly to propellers used on speed boats and with either in-board or out-board motors.

One of the prime objects of the invention is to design a propeller comprising concentrically arranged inner and outer sleeves having blades thereon, the blades on the inner sleeve being of less pitch than the pitch on the outer blades, thus providing smoother, straight-ahead starting torque to start and force acceleration of the boat through the water, after which the blades of the outer sleeve will provide increased driving torque to drive the boat at higher speeds.

Another object of the invention is to design a propeller of simple, practical and economical construction, which provides for fast, smooth get-away when the boat is started, as well as efficient propulsion of the boat at high speeds because of minimum displacement due to water resistance.

A further object is to provide a propeller which can be readily mounted on the drive shaft of a power plant and which requires no change in the shaft or conventional method of mounting.

Still a further object is to provide a unitary twin propeller mechanism, one of which is extremely efficient and stable to start and propel the boat at low propulsion speeds, while the other is most efficient at high propulsion speeds.

A further object still is to design a unitary propeller comprising inner and outer blades concentrically arranged with relation to each other.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawing, and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportion, and minor details of construction, without departing from the spirit, or sacrificing any of the advantages of the invention.

In the drawing:

Fig. 1 is a side elevational view of an outboard motor showing my improved twin propeller in place on the propeller shaft thereof.

Fig. 2 is an enlarged, sectional, elevational view of the propeller.

Fig. 3 is a side elevational view thereof.

Fig. 4 is a view similar to Fig. 2 showing a slightly modified design.

Fig. 5 is a view taken on line 5—5 of Fig. 1.

Referring now more particularly to the drawing in which I have shown the preferred embodiment of my invention the letter O indicates a conventional out-board motor such as used to power small boats in general. This is provided with a horizontally disposed drive shaft **10** on which the propeller P is mounted, said propeller comprising inner and outer tubular sleeves **11** and **13** on which blades **12** and **14** are cast or secured in any

approved manner, these propeller sections and sleeves being concentrically arranged with relation to each other and for a purpose to be hereinafter more fully described.

The inner blades **12** are designed with a low pitch, in the range of from 10° to 30° pitch, so that when the propeller is driven, the boat (not shown) can be smoothly started and propelled at reasonable speed with minimum turbulence, the low pitch of the blades delivering straight-ahead driving torque which is ideal for staring purposes but inefficient for high speeds. I therefore cast an outer sleeve **13** on the blades **12**, and the propeller blades **14** are secured on the outer face of said sleeve and normally extend the full length thereof, as indicated in Figures 1 and 3 of the drawing, these blades having a very high pitch in the range of from 20° to 80° pitch, this high pitch being best adapted, after the boat has been brought up to speed, to drive the boat at very high speeds on the theory that a high pitch at high speeds presents less water resistance with maximum driving torque.

I wish to direct particular attention to the fact that the front end of the propeller sleeves are spaced from the skeg portion S of the motor which includes an upper leg portion **15**, a dependent portion **16**, and an intermediate annular bearing portion **17** of substantially the outer diameter of sleeve **13** which supports shaft **10**. Accordingly, water readily enters the sleeve **11** at low speeds from in back of bearing **17**, and this sleeve terminates short of the rear end of the sleeve **13**, insuring that the blades **14** will operate in water which has not been unduly agitated so that maximum driving power is obtained. At high speeds a void formed behind the skeg as the boat moves rapidly through the water prevents water from reaching the inner sleeve. Thus at high speeds the blades **12** are not powering the boat but rather the blades **14**, which have top efficiency at high speeds, are doing the driving.

The propeller can be utilized on any kind of boat or power plant and is mounted in exactly the same manner as a conventional propeller.

From the foregoing description, it will be obvious that I have perfected a very simple, practical, high-speed, unitary propeller which provides for fast starting and acceleration and also for efficient propulsion at high speeds with a minimum displacement of the water.

What I claim is:

1. In combination, an outboard motor including a depending skeg and a horizontal drive shaft supported a considerable distance above the lower end of the skeg, a propeller fixed on said drive shaft a spaced distance rearward of the skeg comprising an inner sleeve fitting on said shaft and an outermost sleeve concentric with said inner sleeve a spaced distance radially outward thereof, circumferentially spaced, outer, helical blades of relatively high pitch secured at their inner ends to said outermost sleeve with their outer ends free to contact water from all directions, circumferentially spaced, helical, inner blades of substantially lower pitch than said outer blades secured at their inner and outer ends to the inner and outermost sleeves respectively with the said skeg extending beyond said inner blades so that at high speeds an air pocket is formed behind the skeg and no water reaches the inner blades so that the outer blades of high pitch solely drive through the water at high speeds, said different pitches of the inner and outer blades being such that at low starting speeds the inner blades drive through the water while at high speeds no water reaches the inner sleeve behind the skeg and the outer blades drive through the water and exert the thrust.

2. In combination, an outboard motor including a depending skeg and a horizontal drive shaft supported a considerable distance above the lower end of the skeg,

a propeller fixed on said drive shaft a spaced distance rearward of the skeg comprising an inner sleeve fitting on said shaft and an outermost sleeve concentric with said inner sleeve supported a spaced distance radially outward thereof, circumferentially spaced, outer, helical blades of relatively high pitch secured at their inner ends to said outermost sleeve with their outer ends free to contact water circumferentially from all directions, circumferentially spaced, helical, inner blades of substantially lower pitch than said outer blades secured at their inner and outer ends to the inner and outer sleeves respectively with the skeg extending beyond said inner blades so that at high speeds an air pocket is formed behind the skeg and no water reaches the inner blades so that the outer blades of high pitch solely drive through

the water at high speeds, said different pitches of the inner and outer blades being such that at low starting speeds the inner blades drive through the water while at high speeds no water reaches the inner sleeve behind the skeg and the outer blades drive through the water and exert the thrust, the inner sleeve and blades thereon being spaced at least no further rearward from the skeg than the outer sleeve and blades thereon so that the blades on the outermost sleeve do not interfere with the operation of the inner blades at low speeds.

References Cited in the file of this patent

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