Aug. 9, 1960 F. M. PETERSON 2,948,250

AIR THRUST BOAT

Filed March 7, 1955

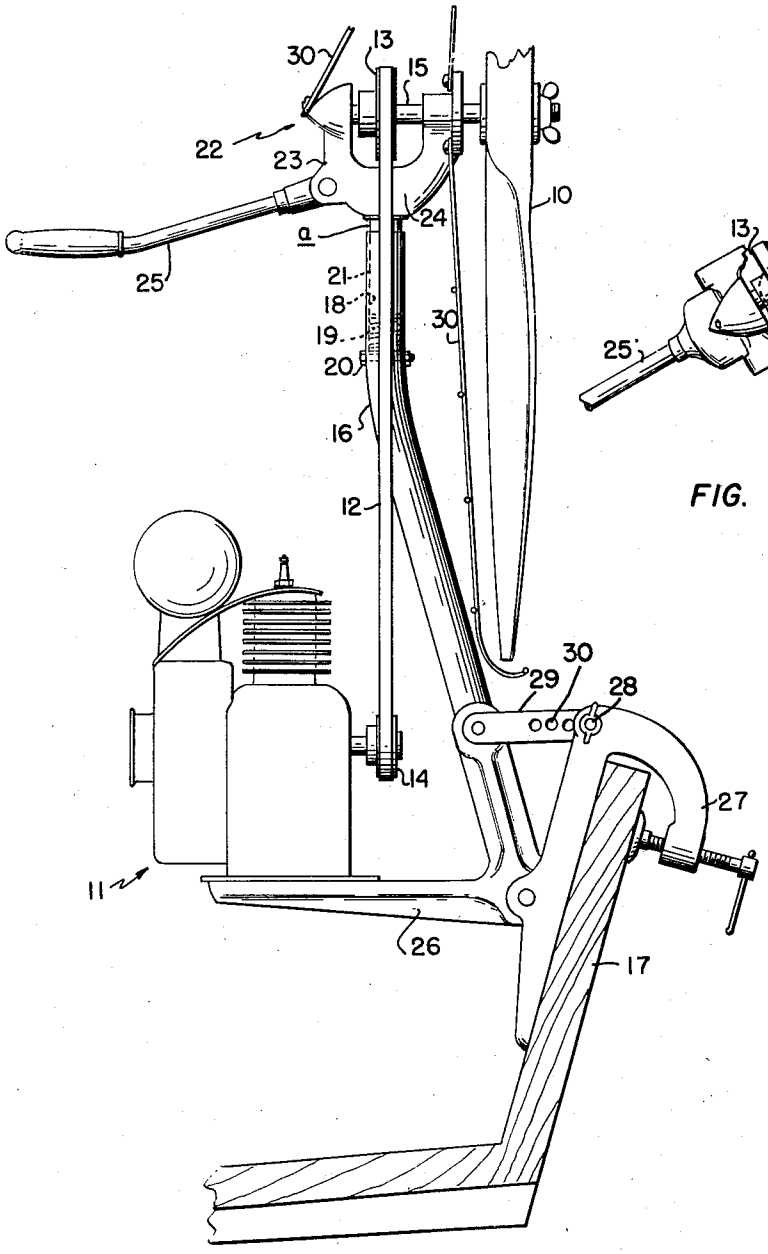


FIG. 1.

FIG. 2.

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AIR THRUST BOAT

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2 Claims. (Cl. 115—.5)

This invention relates to air thrust propeller driven boats and has reference to a steering mechanism therefor.

Boats of the air thrust propeller driven type have found wide application and accepance in areas where shallow water, reeds, everglades and sub-surface debris present hazards to the operation of submerced propellers.

Steering of boats driven by air thrust propellers is generally accomplished by rudders of either the conventional boat type submerged in water or the aircraft type mounted in the slipstream of the air thrust propeller. The operation of the former is objectional because any submerged movable part is subject to the previously mentioned hazards; steering by the latter is sluggish and inefficient since it is dependent upon deflection of a dissipating slipstream of air.

Another method of steering air thrust propeller driven boats consists of changing the direction of thrust by rotating both engine and propeller about a vertical axis. This method has never received wide acceptance because the consequent elevated mounting of a heavy engine high above the water line of a boat greatly decreases that boat's lateral stability and presents a safety hazard when the direction of thrust is rotated more than a few degrees from the boat's bow line. This steering method has the additional disadvantages of offering no inherent self-centering characteristic; once turned this type steering mechanism will continue to turn the boat until such time as the operator returns the mechanism to a centered position. This lack of as elf-centering characteristic makes the following of a set course tedious and tiring for the operator.

An important object of this invention is to provide an efficient, rudderless, self-centering steering mechanism for air thrust propeller driven boats.

A further object of this invention is to provide means whereby the center of gravity of air thrust propeller driven boats may be lowered in such a way as to make possible safe changes in the direction of propeller thrust force relative to the boat, thereby accomplishing a practical means of utilizing thrust force for steering purposes.

A further object of this invention is to provide a prepeller assembly for the purpose of driving and steering an air thrust boat which may be rotated about a vertical axis independent of the position of its prime mover and which may be detached from that prime mover without the use of tols for purposes of portability.

In the drawings:

Figure 1 is a side elevation of the device attached to a boat, only a fragmentary portion of the latter being shown.

Figure 2 is a plan view of the same with the propeller shaft broken away and propeller, motor and transom clamp deleted.

Referring to the drawings, it will be noted that the propeller **10** is powered by an engine **11** through a V-belt **12** around the pulleys **13** and **14** which turn a propeller shaft **15**. The driving pulley **14** is directly connected with the engine **11**, whereas the driven pulley **13** is mounted on the propeller shaft **15**. The vertical support **16** is constructed and positioned so that its upper portion lies in a straight line between the centers of the driving pulley **14** and the driven pulley **13**, whereas its lower portion extends downward bending away from the driving pulley **14** toward the transom **17** of the boat. A cylindrical opening **18** is provided within the upper end of the vertical support **16**, and a coil spring **19** is recessed therein and supported by a bolt **20**. Journaled into the cylindrical opening **18** and supported on the spring **19** is a pivot shaft **21**, the axis of which is coincident with a straight line extending through the centers of the pulleys **13** and **14**, and perpendicular to the axes of rotation of pulleys **13** and **14**. The U-shaped propeller shaft bearing mount **22** is affixed at its base to the top of the pivot shaft **21** and shaped with bearing ends **23** and **24** extending upward equally from its base a distance greater than the radius of driven pulley **13**. The propeller shaft **15** affixed to the propeller **10** is journaled in the ends of the U-shaped propeller shaft bearing mount **22** so that its axis of rotation is perpendicular to the axis of rotation of the pivot shaft **21**. The driven pulley **13** is mounted on the propeller shaft **15** and affixed thereto between the upward extending ends **23** and **24** of the bearing mount **22**. The spring **19** urges the pivot shaft **21** upwardly providing a space *a* between the upper end of the vertical support **16** and the lower end of the bearing mount **22**. A tiller **25** is pivotally attached in a vertical plane to the U-shaped propeller shaft bearing mount **22** near its base at the end of said mount opposite to and extending away from the propeller **10**. The base of the vertical support **16** is affixed to an inwardly projecting L-shaped engine mounting bracket **26** which is pivotally attached in a vertical plane to a transom clamp **27** and suspended therefrom by an adjustable pin **28** and pivoted parallel links **29** having pin receiving holes **30** therein. The engine mounting bracket **26** supports the engine **11** in a horizontal position beneath and forwardly of the U-shaped propeller shaft bearing mount **22**.

In operation the direction of thrust as developed by the propeller **10** relative to the position of the boat may be altered by rotating the propeller shaft bearing mount **22** about its vertical axis by means of the tiller **25**. The low position of the weight of the engine **11** with respect to the center of gravity of the boat permits this change of thrust direction to be used effectively for steering purposes without loss of lateral stability and the commensurate danger of capsizing. Rotation of the propeller shaft bearing mount **22** by means of the tiller **25** results in a decrease in the effective length of the V belt **12** and a corresponding decrease in the distance between the pulleys **13** and **14** causing an increased compression in the spring **19** which supports the pivot shaft **21**. When the tiller **25** is released from its rotated position the pressure from the compressed spring **19** forces the V-belt **12** back to its longest effective length which exists when the axis of rotation of the driving pulley **14** is parallel to the axis of rotation of the propeller **10**.

When this device is not in use it is so constructed as to permit dismantling without tools into two portable assemblies by pulling down on the V belt **12** to compress the spring **19**, thereby removing tension from the belt in its lower part so that it may be disengaged from the lower pulley **14**. The upper assembly consisting of the propeller **10**, safety frame **30**, propeller shaft **15**, driven pulley **13**, propeller shaft bearing mount **22**, tiller **25**, V belt **12** and pivot shaft **21** may then be lifted from the vertical support **16** and carried as a separate unit.

This invention is not limited to the exemplary construction herein shown and described, but may be made in various ways within the scope of the appended claims.

What is claimed is:

1. A steering device for an air thrust propeller driven boat, said steering device including a vertical support carried by said boat and extending upwardly thereabove, a vertical pivot shaft rotatably received in the upper end of said vertical support, a bearing mount rotatably mounted in the upper end of said vertical shaft, a horizontal shaft journalled in said bearing mount and adapted to support and rotate the propeller, a driven pulley mounted on said horizontal shaft and positioned over the axial center of the upper end of said vertical shaft, a drive pulley beneath the upper end of said vertical shaft and in alignment with the axis of said shaft, a belt around said pulleys and positioned outwardly of and along opposite sides of said vertical support and said pivot shaft, and a tiller connected with said bearing mount.

2. A steering device for an air thrust propeller driven boat, said steering device including a vertical support carried by said boat and extending upwardly thereabove, a vertical pivot shaft rotatably received in the upper end of said vertical support, a bearing mount rotatably mounted in the upper end of said vertical pivot shaft, a horizontal shaft journalled in said bearing mount and adapted to support and rotate the propeller, a driven pulley mounted on said horizontal shaft and positioned over the axial center of the upper end of said vertical shaft, a drive pulley beneath the upper end of said vertical shaft and in alignment with the axis of said shaft, a belt around said pulleys and positioned outwardly of and along opposite sides of said vertical support and said pivot shaft, a tiller connected with said bearing mount, and an L-shaped engine mounting bracket adapted to be mounted on the transom of a boat, said L-shaped engine mounting bracket having an engine mounted thereon, the lower end of said vertical support being mounted on said engine mounting bracket, said driving pulley being mounted to be driven by the crank shaft of said engine.

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