June 19, 1962 J. V. BAKER 3,039,422

PEDAL OPERATED PADDLE SYSTEM FOR BOATS

Filed Jan. 7, 1960

FIG. 1.

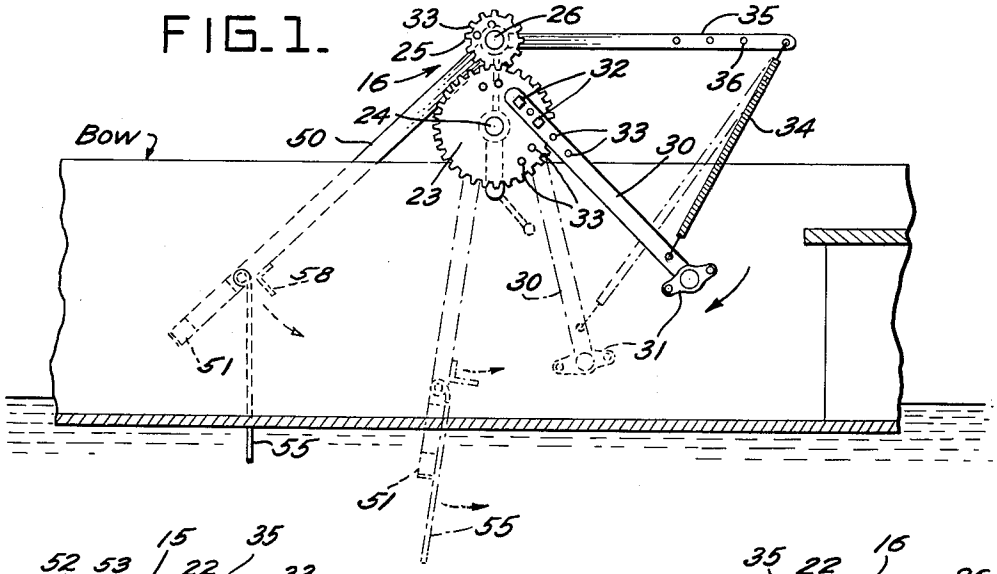


FIG. 2.

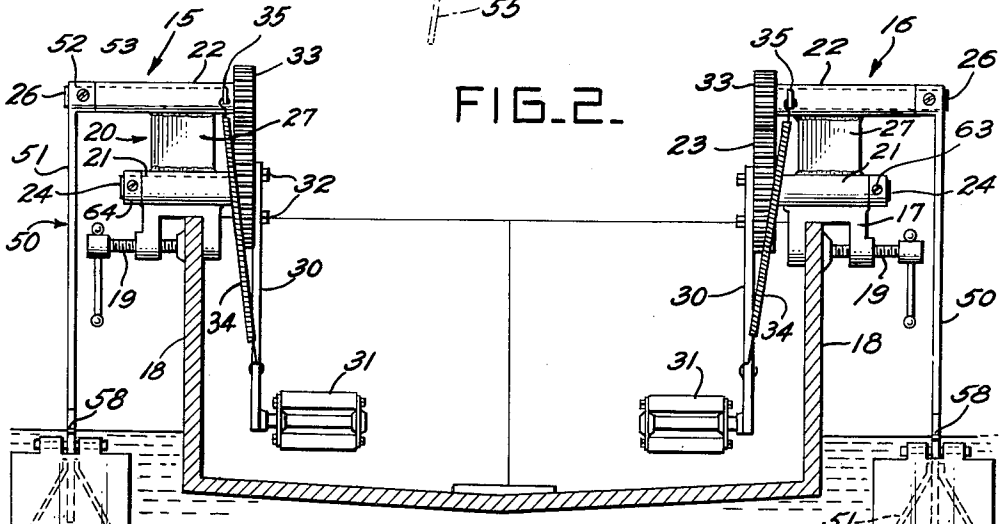


FIG. 3.

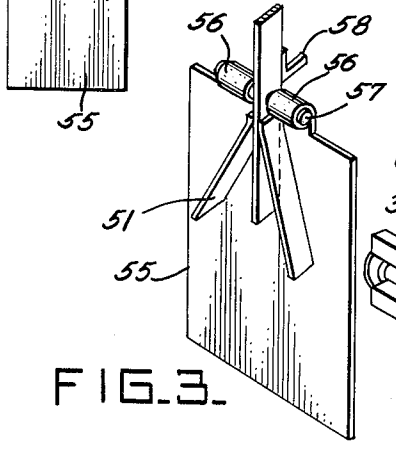
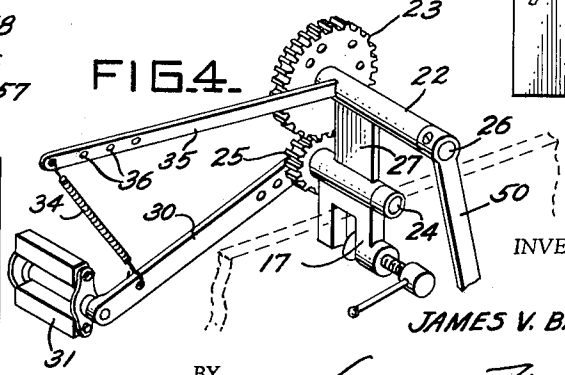


FIG. 4.



INVENTOR

JAMES V. BAKER

BY Wynne & Finken

ATTORNEY

United States Patent Office 3,039,422 Patented June 19, 1962

3,039,422

PEDAL OPERATED PADDLE SYSTEM FOR BOATS

James V. Baker, 202 Pine Park, Jackson, Miss.

Filed Jan. 7, 1960, Ser. No. 1,069
1 Claim. (Cl. 115—25)

My invention relates to an apparatus for moving a boat through the water. More specifically, my invention relates to an apparatus removably attached to the gunwales of a boat on port and starboard sides for pedal operation by the operator.

Numerous attemps in the past to accomplish marine propulsion by means of pedal operated devices have been presented but have met with little actual success because of complicated designs and exorbitant manufacturing cost. It is my purpose through my invention to provide a sturdy and substantially fool-proof mechanism for marine propulsion which can be economically manufactured with standard parts and operated at a high mechanical efficiency through reduction of friction losses and destructive torque forces. Further, my invention provides an apparatus which is easily manipulated by the operator to produce a powerful and smooth propulsion force. Through proper manipulation of the foot pedals, delicate and complete control of the movement of the boat can be accomplished.

My invention is particularly suited for fishermen as it leaves both hands free and provides a propulsion system which can be quietly operated in a smooth and continuous manner with a high degree of control. Adjustment means are provided to enable precise regulation of the driving stroke length and speed.

My invention includes a mounting means for connecting the apparatus to opposed locations on the port and starboard sides of a boat. At each side of the boat there is a first bearing rigidly affixed to the mounting means, a drive gear having its affixed shaft journalled in the bearing, the drive gear operatively engaging a driven gear mounted in a second bearing affixed to the first bearings, the driven shaft of the driven gear extending through its bearing to the outside of the boat, a power arm rigidly affixed to the driven shaft and a hinged paddle mounted on the lower end of the paddle arm for predetermined movement in the water. Preferably, a return spring is provided for biasing the paddle to its retracted position. A foot pedal is mounted on a drive rod rigidly affixed to the drive gear. The fine points of the design will be more explicitly presented hereinafter.

Various other objects and meritorious features of my invention will be apparent from the following description taken in conjunction with the drawings wherein like numerals refer to like parts throughout the several figures and wherein:

FIG. 1 is a sectional side view of a portion of a boat with the starboard unit mounted thereon;

FIG. 2 is a sectional end view of a boat looking toward the bow with both port and starboard units mounted thereon;

FIG. 3 is a perspective view of the paddle portion; and

FIG. 4 is a perspective view of a modified unit providing a shorter stroke.

Referring now to FIGS. 1 and 2, it will be seen that my invention includes a port unit **15** and a starboard unit **16** which may be interconnected by a frame means (not shown) if desired. Preferably, however, my apparatus includes separate port and starboard units, these units being mirror copies of each other in major respects.

Each unit includes a mounting means having U-member **17** which rests on the gunwale **18** of the boat and extends down over the hull. Screw threaded clamping means **19** is threadedly received in the outboard leg of U-member **17** to enable rigid mounting of the unit to the

boat by drawing the inboard leg of U-member **17** in engagement therewith.

A bearing housing means **20** which includes a first bearing **21** and a second bearing **22** is welded to the U-member **17** of the mounting means. Each bearing extends athwartships and the bearings are spaced apart by web **27** in a vertical direction a predetermined distance sufficient to receive the gear means. It will be noted that a large drive gear **23** is removably affixed to a shaft **24** (shown in phantom) journalled in the first bearing **21** and that the small driven gear **25** is similarly mounted in a fixed manner to its shaft **26** (shown in phantom), which in turn is journalled in the second bearing **22**. A unique feature of my design is the location of the gears inboard to provide a balancing of forces produced by the inherent weight of the unit as well as the strains produced by the torques developed during use to prevent the production of severe force couples which damage the structural integrity of the hull as well as the unit itself.

Extending rearwardly and downwardly from the large drive gear **23** is a drive rod **30**, this rod being adjustably affixed to the gear. A foot pedal **31** extends athwartship from the lower portion of the drive rod **30** for foot operation, the rod being adjustable on the gear **23** to enable conformance with the operator's physical characteristics and power requirements. Suitable bolt clamping means **32** are provided which extend through an enlarged opening **33** in the drive gear **23** and drive rod **30** for length and angular relationship adjustment.

Spring means **34** is provided for the return of the pedal **31** to the retracted position and in the preferred design shown the spring means **34** is connected at one end to the lower portion of the drive rod **30** and at the other end to a rearwardly extending member **35** of the frame at its other end. Adjustment means, such as spaced connecting zones or holes **36**, are provided for regulating the tension on the spring means **34** to control the retractive force and the extent of retraction.

The paddle assembly **50** is rigidly affixed to the driven shaft **26** extending through the second bearing **22**. This paddle assembly includes the paddle arm **51**, which extends downwardly outside the hull of the ship into the water and which has a collar **52** held rigidly to shaft **26** by a set screw **53**. The lower end of the paddle arm **51** has a paddle backing spider **54** against which the paddle **55** bears when being forced through the water in a rearward or sternward direction (FIG. 3). The paddle **55** is suitably shaped; preferably a rectangular member with spaced looped over ears **56** at its upper end is pivotally mounted on the arm **51** near its lower portion by means of pivot pin **57** which passes through the arm and through the bearing formed by ears **56** in the upper end of the paddle. A rearwardly extending stop member **58** is rigidly affixed to the arm **51** and mounted immediately above the pivot pin **57** for limiting the upward pivoting movement of the paddle **55**.

FIG. 4 shows a unit arranged for a short paddle stroke through the water on each cycle. The small gear **25** has been moved down to the drive shaft **24** and the large gear **23** has been moved up to the driven shaft **26**. The mechanical advantage attained enables the production of a shorter and less tiring stroke on each cycle.

It will be noted in FIG. 1 that one position of the paddle assembly **50** and pedal **31** is shown in full lines and that a second position of the units is shown in phantom lines. The second position shows the paddle at a point of high force effect on the water. Various propulsion requirements can be met by varying the angle of attachment of the drive rod **30** to the drive gear **23** by suitable alignment in mounting holes **33**. Similiarly, the spring tension may be varied by utilizing different

tension settings or holes **36**. The angular relationship of pedal and paddle may also be varied by releasing the set screw **53** and/or set screw **63** on collar **64** so that that gears may be disenaged from each other and rotated for engagement at the desired angular setting.

In operation, it will be recognized that the operation of the port pedal alone will cause a turning of the boat and by suitable manipulation a precise control and excellent maneuverability can be attained.

It will be recognized that the basic elements of my invention are of sturdy and uniquely simplified design. The unit may be manufactured as a mass production item without expensive tooling and for a low cost may be provided to a user.

While the invention has been described in terms of certain embodiments and examples, these are to be considered as illustrative rather than limiting and it is desired to cover all modifications and further embodiments that fall within the spirit and scope of the appended claim.

I claim:

In a paddle apparatus for boat propulsion, the combination which includes a frame means, clamp means rigidly affixed to said frame means and adapted to be removably clamped to the gunwale of a boat, said frame means including a lower bearing means extending athwartships when in clamped position on a boat and an upper bearing means vertically aligned therewith, a drive shaft mounted in said lower bearing, a drive gear removably and rigidly mounted on said drive shaft, a driven shaft mounted in said upper bearing, a driven gear removably and rigidly mounted on said driven shaft and meshed with said drive gear, a drive rod affixed to said drive gear and extending downwardly therefrom, a foot pedal extending athwartships and connected to the lower portion of said drive rod, a power arm affixed to the outboard end of said driven shaft and extending downwardly, a paddle attached to the lower portion of said power arm, a spring support extending rearwardly from said frame, a spring means interconnecting the spring support and the lower portion of said drive rod, means for adjusting the spring tension of said spring means, means for adjusting the length and angular disposition of the drive rod, said means for adjusting the length including bolt means and a series of bolt receiving holes in said drive rod and said drive gear, said holes in said drive gear being arcuately spaced, said means for adjusting the spring tension including spaced holes along said spring support.

References Cited in the file of this patent

UNITED STATES PATENTS

839,595	Johnson	Dec. 25, 1906
1,914,901	Thompson	June 20, 1933