Oct. 11, 1955 C. E. SEVER ET AL 2,720,185

PEDAL OPERATED FLUID DRIVES FOR BOAT PROPELLERS

Filed Oct. 29, 1952 3 Sheets-Sheet 1

Fig. 1

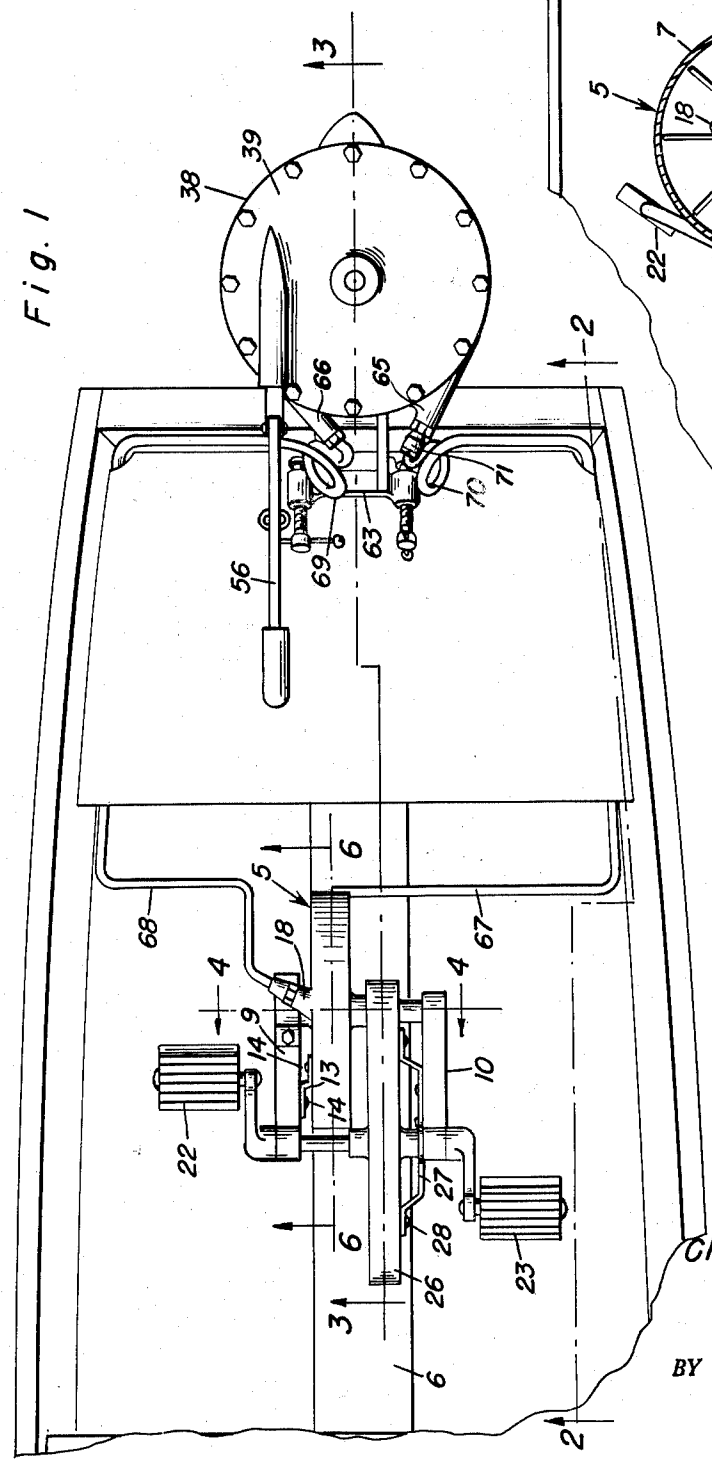
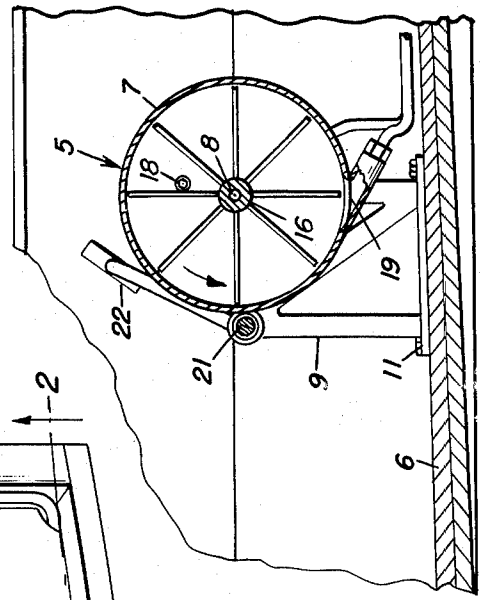


Fig. 6



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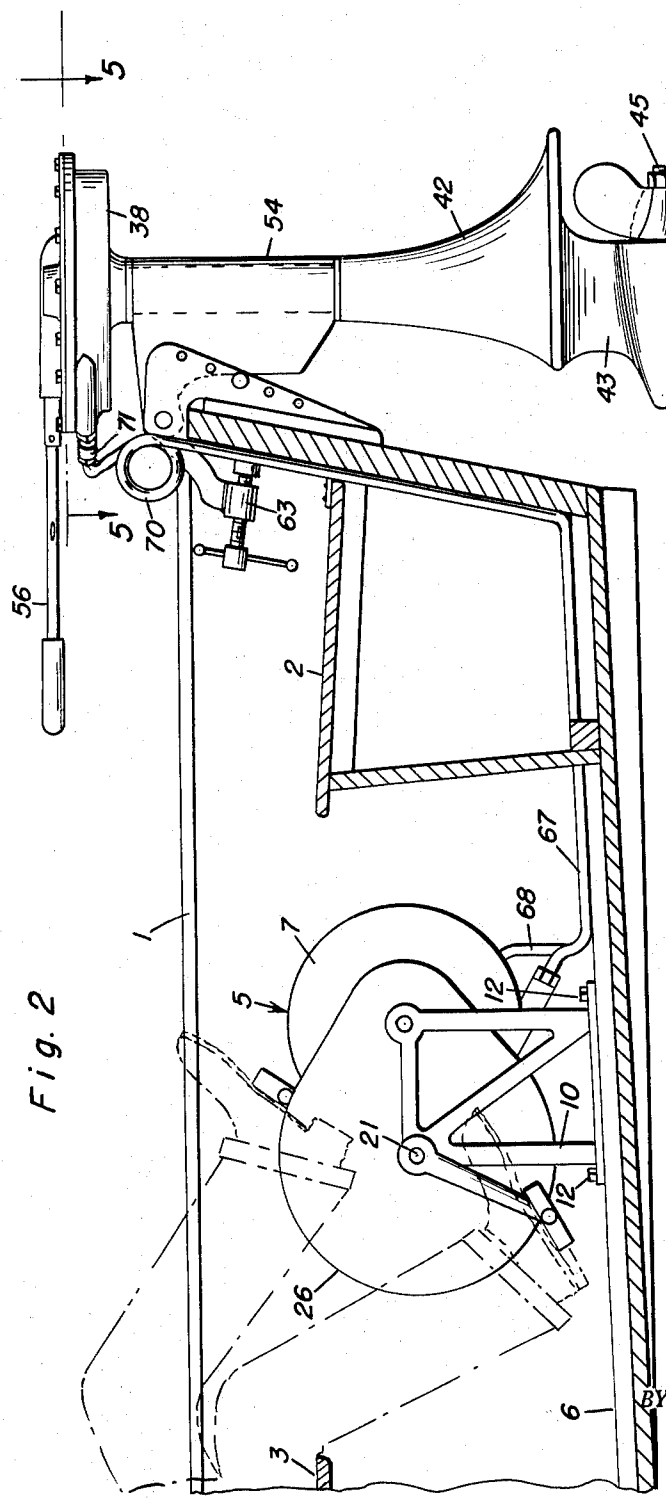

Fig. 2

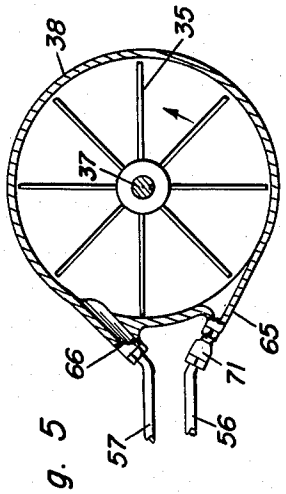

Fig. 5

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Filed Oct. 29, 1952 3 Sheets-Sheet 3

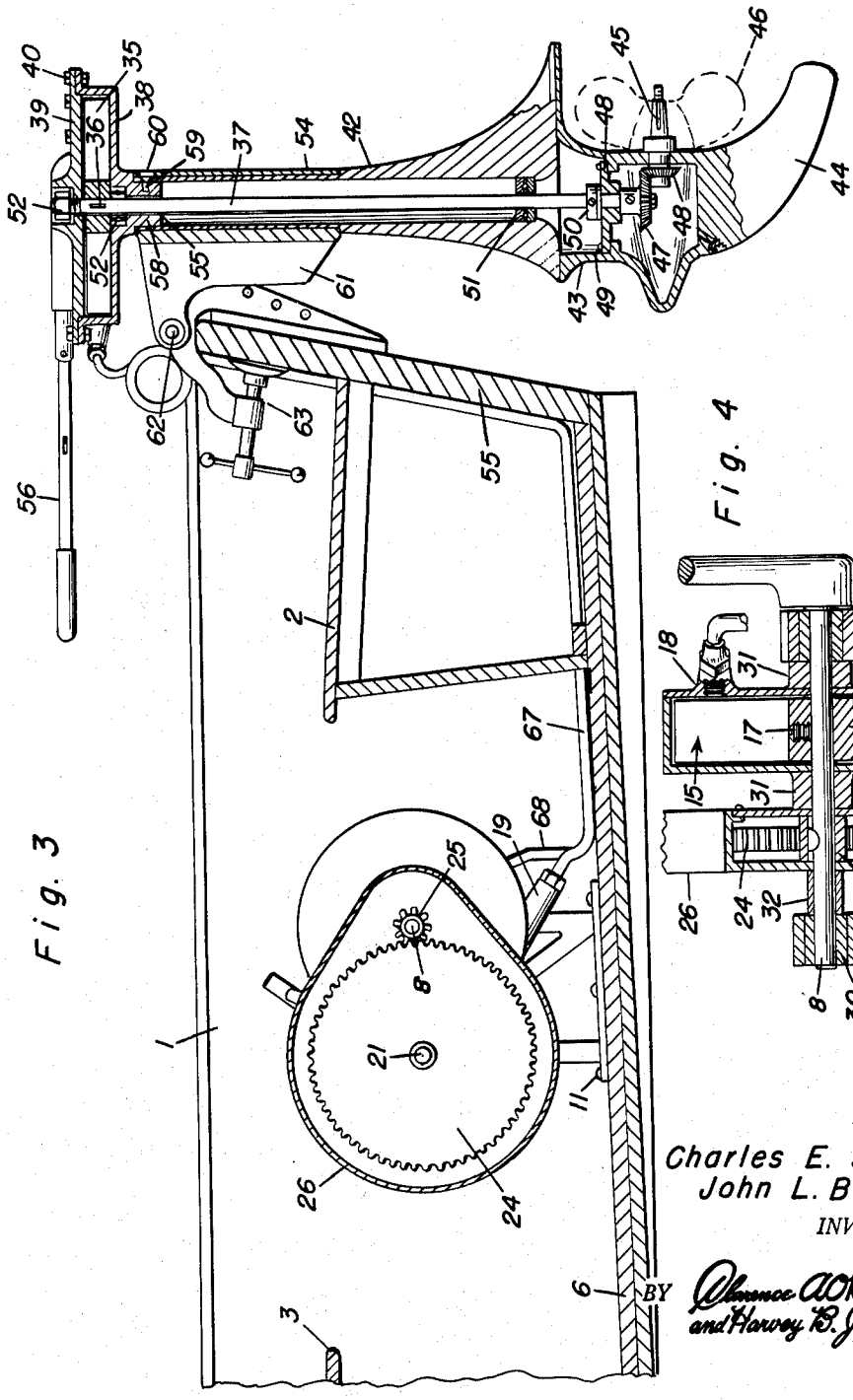

Fig. 3

Fig. 4

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United States Patent Office 2,720,185 Patented Oct. 11, 1955

2,720,185

PEDAL OPERATED FLUID DRIVES FOR BOAT PROPELLERS

Charles E. Sever and John L. Barger, Little Rock, Ark.

Application October 29, 1952, Serial No. 317,562

1 Claim. (Cl. 115—25)

Our invention relates to pedal operated fluid drives for the propellers of outboard motors for boats.

The primary object of our invention is to provide for driving the propeller of an outboard motor by fluid pressure generated by a pump which is operative easily by foot pedals to generate the required pressure for driving the propeller at comparatively high speed.

Another object is to provide a pedal operated fluid drive for such propellers which is of simple construction, to reduce the cost of manufacture, easy to apply to a conventional rowboat, or the like, and economical to use and service.

Other and subordinate objects, within the purview of our invention, together with the precise construction and operation thereof will become apparent when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a fragmentary view in plan of our improved pedal operated fluid drive applied to a boat;

Figure 2 is a view in longitudinal vertical section taken on the line 2—2 of Figure 1;

Figure 3 is a similar view taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary view in transverse section taken on the line 4—4 of Figure 1;

Figure 5 is a view in horizontal section taken on the line 5—5 of Figure 2, and

Figure 6 is a view in vertical section taken on the line 6—6 of Figure 1.

Referring by numerals to the embodiment of our invention illustrated in the accompanying drawings, 1 designates a conventional flat bottom rowboat having a stern seat 2 and an intermediate seat 3.

According to our invention a centrifugal pump 5 is provided on the usual longitudinal catwalk 6 and between the stern and intermediate seats 2, 3.

The pump 5 comprises an upright circular casing 7 having an axial pump shaft 8 suitably journaled thereon transverse to the boat 1 and in a pair of laterally spaced, bearing brackets 9, 10 upstanding from the catwalk 6 and bolted thereto as at 11, 12. The casing 7 is fixed by a metal strap 13 and bolts 14 to the bracket 9 against rotation.

A suitable bladed, fluid impeller, or rotor, 15 in the casing 7 is fixed by a hub 16 and a setscrew 17 on the pump shaft 8. Fluid is admitted into the pump casing 7 through an intake nipple 18 on one side of said casing adjacent the axis thereof, and discharged through a discharge nipple 19 at the bottom of said casing.

A pedal operated gear drive for the impeller 15 is provided comprising the following. A horizontal drive shaft 21 is journaled adjacent its ends transversely and forwardly of the pump 5 in the bearing brackets 9, 10 with a pair of pedals 22, 23 fast on the opposite ends thereof outwardly of said brackets. A large driving gear wheel 24 fast on the drive shaft 21 meshes with and

drives a smaller gear wheel 25 fast on the pump shaft, the ratio of drive being substantially 8 to 1.

The gear wheels 24, 25 are preferably disposed in a plane between the pump casing 7 and the bracket 10 and are enclosed in a gear wheel casing 26 through which said shafts 8, 21 are suitably journaled to support the casing 26. A metal strap 27 and bolts 28 secure the casing 26 to the bracket 10. The pump shaft 7 is suitably bushed as at 29, 30 in the brackets 9, 10. Journal bearings 31 on the casing 15 for the pump shaft 7 space said casing 7 from the bracket 9 and gear wheel casing 26, and a spacing sleeve 32 on said shaft 7 spaces the casing 26 from the bracket 10.

The outboard motor comprises a suitably bladed rotor 35 keyed as at 36 on a vertical propeller drive shaft 37 and housed in a horizontal circular rotor casing 38 having a cover 39 bolted, as at 40, thereto. The propeller drive shaft 37 extends downwardly through a downwardly flared upright shaft housing 42 into a streamlined gear housing 43 having a rudder 44 depending rigidly therefrom and suitably fixed on the lower end of housing 42.

The propeller drive shaft 37 is operatively connected in the gear housing 43 to a propeller shaft 45 journaled in the back of the gear housing 43 and extending rearwardly thereof with the usual propeller 46 thereon. The operating connections comprise a bevel gear 47 on the lower end of said shaft 37 meshing with a smaller bevel gear 48 fast on said shaft 45. Above the gear 47 said shaft 37 is journaled at its lower end in a bearing plate 48 bolted at 49 in said housing 42. An end thrust collar 50 on said shaft 37 bears on said plate. Suitable antifriction bearings 51, 52 are provided in said housing 42 and casing 38 for the propeller drive shaft 37. The upper end of the propeller drive shaft 37 is journaled in the cover plate 39 with a nut 52 thereon removable for removal of said plate.

The propeller shaft housing 42 is rotatably mounted at its upper portion in a bearing sleeve 54 for steering purposes, said sleeve being mounted on the transom 55 of the boat by means presently described. A tiller 56 is suitably connected to the cover plate 39 of the rotor casing 38 to rotate said casing 38 which is operatively connected to the upper end of said housing to rotate the same by a stepped hub 58 on the bottom of the rotor casing 38 seating on said sleeve and fitted in the upper end of the propeller shaft housing 54, said hub 58 being secured to said sleeve 42 by a screw 59 accessible through an aperture 60 in said sleeve.

The sleeve 54 is pivotally mounted by means of a flange 61 thereon and a pivot pin 62 to the conventional outboard motor clamp 63 on the boat transom 55, for vertical tilting of the outboard motor longitudinally of the boat 1, for the usual purposes, under control of the tiller 56.

A pair of fluid inlet and outlet nipples 65, 66 extend tangentially from the forward side of the rotor casing 38, the inlet nipple 65 being connected by a pressure pipe 67 to discharge nipple 19 of the pump 5 and the discharge nipple 57 being connected by a suction pipe 68 to the intake nipple 18 of said pump so that said pump 15 and rotor 35 are interposed in a fluid circuit. The pipes 67, 68 are flexible for instance copper with coils 69, 70 adjacent the rotor casing 38 flexible to compensate for rotation of said casing 38. A reducer valve 71 is provided in the pressure pipe 67 adjacent the inlet nipple 56 to increase the fluid pressure admitted to said rotor casing 38.

The rotor casing 38, pipes 67, 68 and pump casing 7 are filled with fluid by pouring the same into said housing 38 with the cover 39 removed.

The operation of our invention will be readily understood. Rotation of the pump impeller 15 counter-clock-

wise as indicated by the arrow in Figure 6, through pedal operation of the described gear drive, will cause pressure in the pipe **67** and suction in the pipe **68** so that the rotor **35** will be rotated counterclockwise, as indicated by the arrow in Figure 5 to correspondingly drive the propeller drive shaft **37**, which through the gears **47**, **48** will rotate the propeller **46** to propel the boat **1** forwardly. The manner in which steering is accomplished has already been explained. As will be understood the pedals **22**—**23** are within easy reach of either seat **2**, **3**.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claim.

What is claimed as new is as follows:

In combination with a boat having swingably mounted thereon a casing of a fluid operative rotor operatively connected to a propeller drive shaft, a pair of laterally spaced brackets attachable in upstanding position in said boat, a pedal operated shaft journaled in said brackets, a centrifugal pump between said brackets having a casing attached to one bracket and a pump shaft journaled at both brackets, gearing between said brackets operatively connecting the pedal operated shaft to the pump shaft, and flexible pipes connecting opposite sides of the pump to oposite sides of the casing of the rotor.

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