Oct. 14, 1930. G. McDOWELL 1,778,331

TURBINE MOTOR

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Fig. 1.

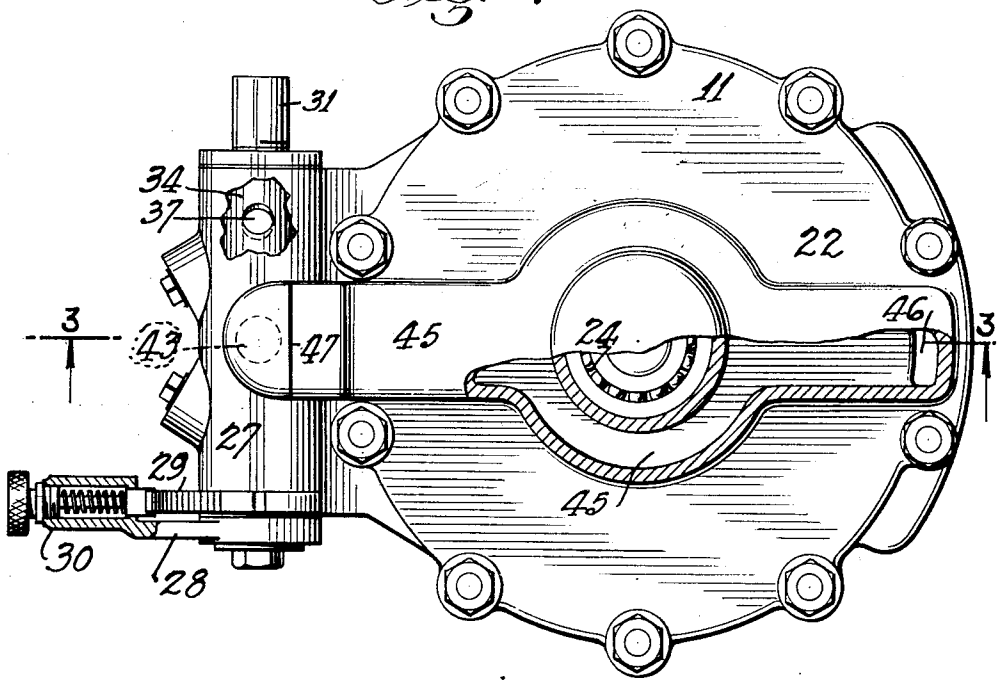
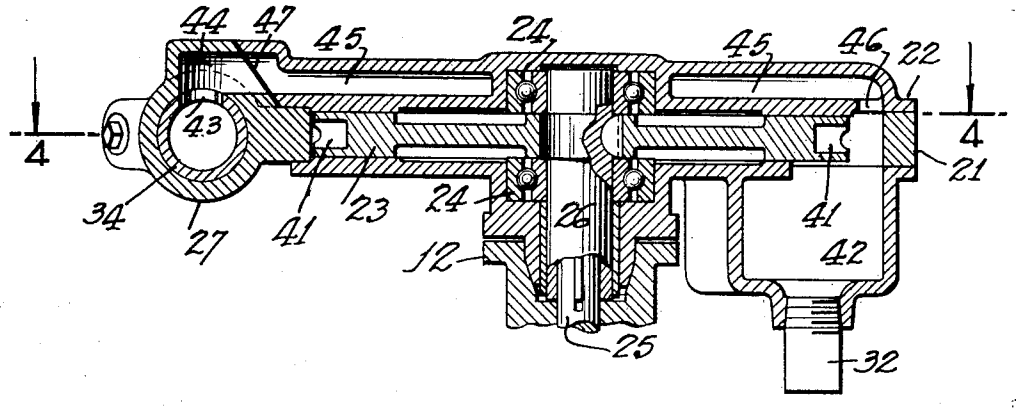


Fig. 2.



INVENTOR
George McDowell
BY
M. M. Haughridge
ATTORNEY

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Fig. 3.

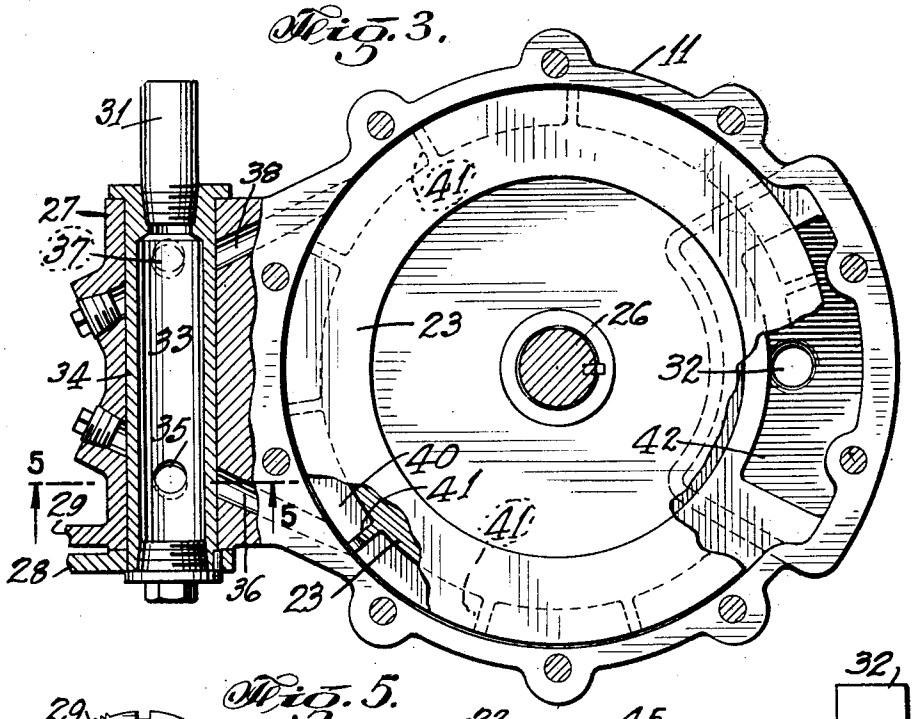

Fig. 5.

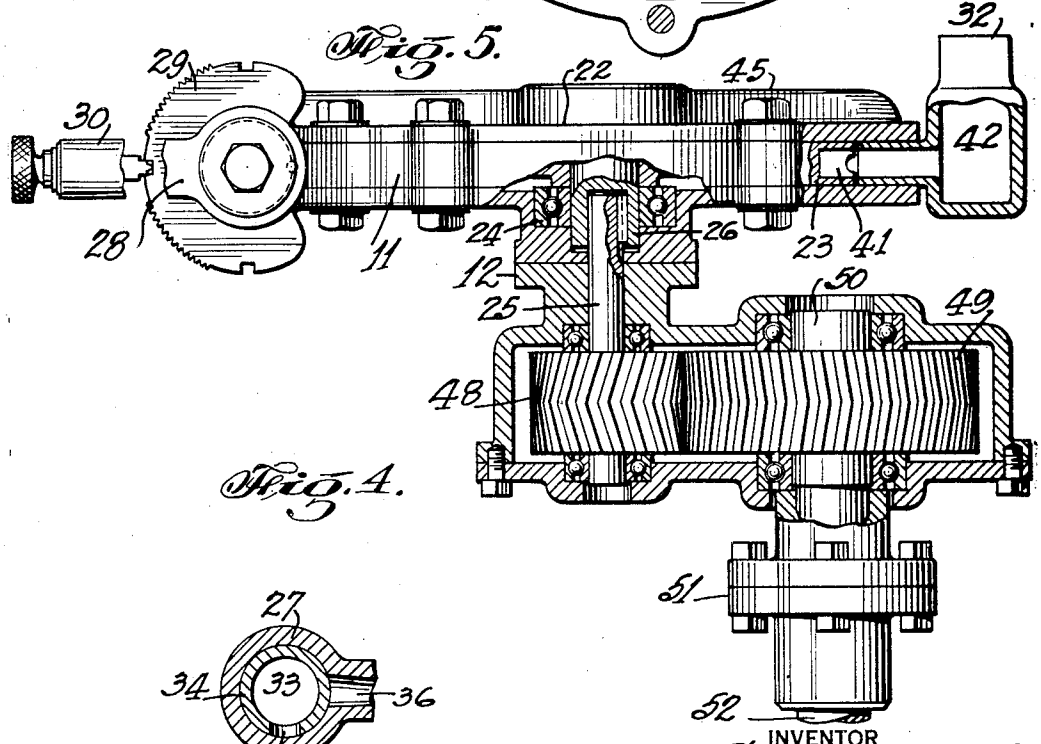

Fig. 4.

INVENTOR

George McDowell

BY

M. M. Langridge

ATTORNEY

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UNITED STATES PATENT OFFICE

GEORGE McDOWELL, OF BROOKLYN, NEW YORK

TURBINE MOTOR

Application filed November 18, 1929. Serial No. 408,089.

This invention relates to turbine motors which may be operated by hydraulic, steam, air or other fluid pressure and has for an object to provide a turbine type of motor which is compact, capable of high speed, and may be controlled to run in either direction. Another object of the invention is to provide a motor of this type which is small and inexpensive to make and is particularly adaptable for marine and other purposes. Other objects of the invention will appear from the following specifications and the accompanying drawings in which, Fig. 1, is a plan view of the motor and controlling valve with certain parts sectioned to show the construction; Fig. 2, is a sectional elevation corresponding to Fig. 1; Fig. 3, is a plan view of the motor housing and valve with certain parts sectioned to show the construction; Fig. 4, is a detail on line 5—5, Fig. 3 and Fig. 5, is an application of the motor with reduction gear associated therewith, having certain parts of the casing sectioned.

In the present invention a rotor is provided in a suitable housing having radially spaced blades in line with a nozzle for driving the rotor in one direction and with another nozzle for driving the rotor in the reverse direction. A valve is provided having an intake pipe which controls a supply of fluid pressure through these nozzles in such a way that when this valve is in one extreme position the supply of fluid pressure to one of the nozzles is open and is closed to the other nozzle, and when the valve is reversed to the other extreme position the supply of fluid pressure to the nozzles is correspondingly reversed, also when the valve is placed in the intermediate position a by-pass is opened between the supply pipe and the exhaust pipe. Thus by the operation of a single valve the motor may be driven in either direction and the power supplied to the motor can be regulated or entirely by-passed from the motor.

This mechanism is comparatively light and can be applied directly to the propeller shaft and connected with a source of power within the boat so that a better distribution of weight is obtained and where the motor driven unit is portable there is a considerable saving of weight.

The motor comprises a casing or housing 21 which houses the rotor 23 and the valve mechanism 27. This housing is provided with a cover 22 and with bearings at 24 for the sleeve 26 on which the rotor 23 is mounted. The sleeve 26 is splined to the drive shaft 25 in the coupler 12 hereinafter referred to.

The valve 27 is provided with a sleeve 34 having a cavity 33 connecting with the intake pipe 31 and with the ports 35 and 37. This sleeve is rotated by the handle 28 which latches at 30 to the quadrant 29 formed integral with 27. When 30 is raised to the vertical position, Fig. 3, the port 35 connects with the nozzle 36 and the nozzle 38 is closed. When 28 is moved through 180° to the reversed position, port 35 is closed and the port 37 connects with nozzle 38. When 28 is placed in the intermediate position ports 35 and 37 are closed and the port 43, Fig. 2, is open to connect the passage 44 and 45 with the by-pass port 46 to chamber 42 and the outlet pipe 32. The valve 34 is so constructed that the port 43 is partially opened before the ports 35 and 37 are closed so that an excess pressure in the system is relieved through the by-pass under these conditions. It will be observed that the by-pass passage 45 is embodied in the cover 22 and connects with the passage 44 at 47, thereby making a compact construction.

The rotor 23 is provided with spaced blades 41 as indicated in Figs. 2, 3 and 5. These blades align with the nozzles 36 and 38 of the valve mechanism and are in position to be impelled by fluid pressure from these nozzles so that the rotor may be driven in either direction according to the flow of the fluid pressure in nozzles 36 and 38 as determined by the position of the rotary valve 34.

A pocket is provided at 42 in the housing as indicated in Fig. 3 which connects with the outlet pipe at 32. This pocket releases the pressure on the rotor blades when they have reached this position.

In Fig. 5, the construction is modified to show the outlet chamber 42′ constructed separately from the housing 21 and clamped in position by the cover 22. In this figure the

construction is further modified to include the reduction gear 48 mounted on shaft 25 and meshing with the gear 49 mounted on sleeve 50 and splined to the drive shaft 52 connected to the mechanism by the coupler 51.

Having thus described my invention, I claim:

1. A turbine motor as described, comprising a casing, a fluid supply, a rotor with blades in said casing, a rotary valve controlling said supply, a pair of intake ports and an outlet port from said rotor in said casing, a nozzle leading from said valve to one of said intake ports for conducting fluid pressure to rotate said rotor in one direction and a second nozzle leading from said valve to the other of said intake ports for conducting fluid pressure to rotate said rotor in the opposite direction, means for operating said valve to close either nozzle and open the other nozzle and to by-pass said supply to said outlet port.

2. A turbine motor as described, comprising a casing, a rotor with blades therein and a valve mechanism, a cover for said casing, said valve having an intake port, said casing having an outlet port, a passage in said cover connecting said valve mechanism with said outlet port, a valve in said mechanism controlling a fluid pressure supply to said rotor blades to rotate the rotor in both directions and to by-pass the supply through the passage in said cover.

3. A turbine motor as described, comprising a casing, a rotor with blades therein and a valve mechanism, having an intake port, said casing having an outlet port, a passage connecting said valve mechanism with said outlet port, a rotary valve in said mechanism controlling fluid pressure to said rotor and when in one extreme position causing said rotor to rotate in one direction and when in the other extreme position causing said rotor to rotate in the opposite direction and when in the intermediate position connecting the fluid pressure to said passage leading to the outlet port.

4. A turbine motor as described, comprising a casing, a rotor with blades therein, and a valve mechanism, having an intake port said casing having an outlet port, a nozzle formed in said casing from said valve to the circumference of said rotor on one side, and a second nozzle formed in said casing from said valve to the dimetrically opposite circumference of said rotor and a passage in said casing connecting said valve mechanism with said outlet and a rotary valve in said mechanism controlling fluid supply from the intake port to said nozzles and to said passage.

5. A turbine motor as described, comprising a casing having an outlet port, a rotor with blades in said housing, a valve mechanism comprising a tubular valve with a source of pressure fluid connected with its interior, a nozzle leading from said valve to the circumference of said rotor on one side and a second nozzle leading from said valve to the diametrically opposite circumference of said rotor, a passage leading from said valve to the outlet port in said casing and means for rotating said tubular valve

In testimony whereof I affix my signature.

GEORGE McDOWELL.