C. W. VAN DEURSEN.

PROPELLING DEVICE FOR WATER AND AIR VESSELS.

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Fig. 1

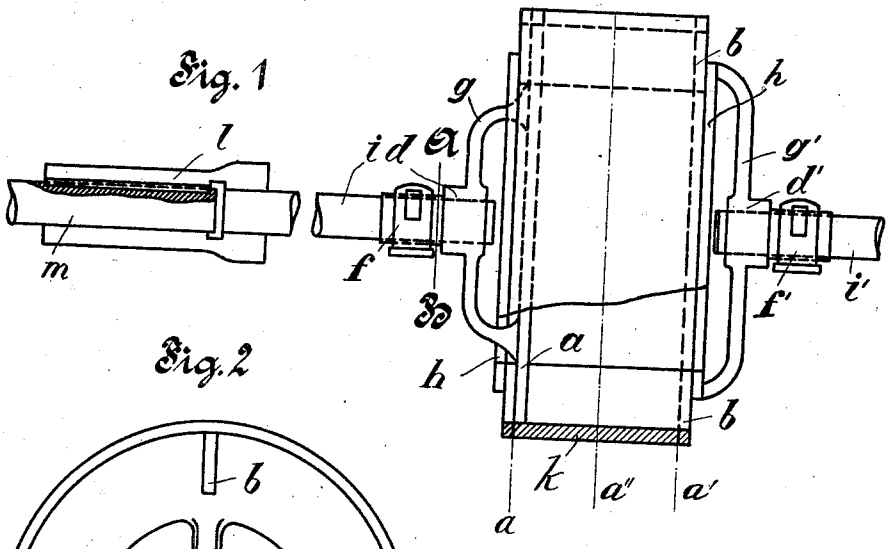


Fig. 2

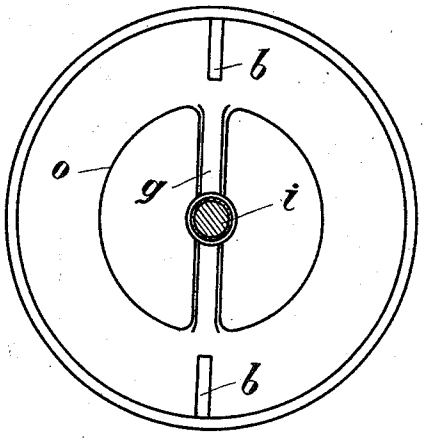


Fig. 3

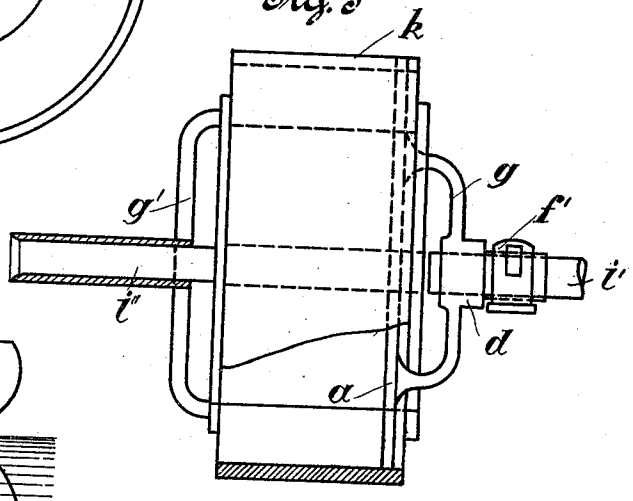
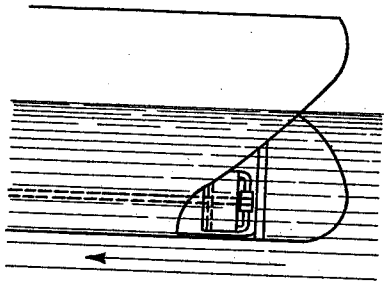


Fig. 4



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UNITED STATES PATENT OFFICE.

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PROPELLING DEVICE FOR WATER AND AIR VESSELS.

1,029,776. Specification of Letters Patent. Patented June 18, 1912.

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To all whom it may concern:

Be it known that I, CORNELIUS WILHELMUS VAN DEURSEN, a subject of the Queen of Holland, residing at Nimwegen, Netherlands, have invented an Improved Propelling Device for Water and Air Vessels, of which the following is a specification.

The present invention relates to an improved device for propelling all kinds of water and air vessels, and consists in the provision, in place of the ordinary screw-propeller, of an open-ended cylinder fitted with internal longitudinal ribs adapted to rotate the fluid together with the cylinder and to guide such fluid, as it is urged by centrifugal force against the cylinder wall, toward the ends of the cylinder. A ring-shaped disk is so arranged in the cylinder that, when placed at one end thereof, it admits fluid through its center into the cylinder but prevents circumferential exit of the fluid at that particular end of the cylinder. The rotating fluid, being thus forced exclusively toward one end of the cylinder, causes a movement of the cylinder and of the vessel in the opposite direction. By adapting the disk and the cylinder to be relatively adjusted, the fluid can be made to flow in either direction or, when the disk has a central position in the cylinder, in both directions, it being thus possible to alter the direction as well as the speed of the movement without altering the rotating direction or the speed of the engines.

In the accompanying drawings the invention is illustrated by way of example, Figure 1 representing a side view of the arrangement, partly in section and partly in elevation, Fig. 2, a cross-section on the line A—B of Fig. 1, Fig. 3, a side view, partly in section, of a modified arrangement, and Fig. 4, a view showing the improved propeller as applied to a water vessel.

The device consists of an open-ended cylinder k which is fitted with a plurality of internal ribs b arranged in the direction of the cylinder axis. A ring-shaped disk a, of the same diameter as the internal diameter of the cylinder k, is arranged in the latter so as to allow of being adjusted in an axial direction, the disk having open-ended slots to accommodate the ribs b.

In the construction shown in Fig. 1, the cylinder is carried by arms g' connected to a hub d', the latter being mounted on a shaft i' which is held and controlled by a bearing f'. The disk a is carried by arms g connected by means of a hub d to the shaft i. This shaft is rotatably and slidably held in a bearing f and is so coupled to the driving shaft of the engine as to allow of axial adjustment without being disconnected from said driving shaft. Any suitable known coupling may be employed for this purpose. By way of example, the shaft i is in Fig. 1, for the purpose of such adjustment, fitted on its end with a sleeve l which is slidably feathered on the driving shaft m. The adjustment of the shaft together with the disk a may also be effected by any suitable known mechanism, for instance by means of a forked lever pivoted to a rotatable element which is held between rigid elements on the shaft. Being well known in connection with clutches and the like, this operating element is left out from the drawing for the sake of clearness.

The *modus operandi* is as follows:—Rotation is imparted to the cylinder k by the disk a owing to the engagement of the latter with the ribs b, the disk being in its turn rotated by the shaft m through the medium of the shaft i. The fluid in the cylinder is thereby set in motion and urged outward by centrifugal force. Following the cylinder wall the fluid tends to escape at the ends of the clyinder. When the disk a has the position shown in Fig. 1, the fluid is prevented by the same from escaping at the left end of the cylinder and is thus compelled to move in a uniform stream toward the right, this causing a movement of the cylinder and the elements connected therewith in the opposite direction. While the fluid is thus expelled at one end of the cylinder, fresh fluid enters into the latter through the central aperture o of the ring-shaped disk a. It is evident that by adjusting the disk a into the position a' at the opposite end of the cylinder the movement is reversed. If the disk is set in the position a'', in the middle of the cylinder, the fluid will be urged with equal force in both directions, in which case no propulsion takes place. It is also evident that any intermediate position of the disk will cause a movement in one or the other direction at a speed depending upon such position. During all these variations in speed and direction, the engines may be driven in the same direction and at a uniform speed.

In order to separate more definitely the

regions of inlet and outlet, a ring h may be connected to the inner ends of the ribs b at each end of the cylinder k, as shown in Fig. 1.

A modified arrangement is shown in Fig. 3, where the disk a is connected to the shaft i' and the cylinder itself adapted for axial adjustment. For this purpose the arms g' are connected to a hollow shaft which is slidably feathered on the driving shaft.

The mode of connecting the elements to the shafts is unimportant and may naturally be varied.

It will be seen from Fig. 4 that the improved propelling device can be arranged on the propeller shaft in the same position as the ordinary screw propeller so that no alteration of the constructional details of the ship is necessary. The device is here shown in connection with a water vessel, but it may be employed with equal advantage in connection with aerial vessels and machines.

Since the centrifugal force is proportional to the square of the velocity, the arrangement is particularly suitable for vessels provided with high speed motors.

In order to lessen the weight of the cylinder and the disk, these elements may be made with double walls, the intermediate space being filled up with air or gas.

I claim;—

1. A propelling device for water and air vessels, comprising an open-ended cylinder mounted on a propeller shaft, internal ribs arranged in axial direction on the cylinder wall so as to set the fluid in the cylinder in motion and expel it by centrifugal force through the ends of said cylinder, and a disk fitted in the cylinder so as to obstruct the axial movement of the fluid, the cylinder and disk being capable of relative adjustment so as to direct the flow toward either or both ends of the cylinder and so to regulate the movement of the vessel, substantially as set forth.

2. A propelling device for water and air vessels, comprising an open-ended cylinder mounted on a propeller shaft, internal ribs arranged in axial direction on the cylinder wall so as to set the fluid in the cylinder in motion and expel it by centrifugal force through the ends of said cylinder, a disk loosely held in said cylinder so as to obstruct the axial movement of the fluid, and means for adjusting the position of said disk in the cylinder so as to direct the flow toward either or both ends of the same and so to regulate the movement of the vessel, substantially as set forth.

3. A propelling device for water and air vessels, comprising an open-ended cylinder mounted on a propeller shaft, internal ribs arranged in axial direction on the cylinder wall so as to set the fluid in the cylinder in motion and expel it by centrifugal force through the ends of the cylinder, and a ring-shaped disk fitted in the cylinder so as to obstruct the axial movement of the fluid at the circumference of the cylinder but allow such movement in the center thereof, the cylinder and disk being capable of relative adjustment so as to direct the flow toward either or both ends of the cylinder and so to regulate the movement of the vessel, substantially as set forth.

4. A propelling device for water and air vessels, comprising an open-ended cylinder mounted on a propeller shaft, internal ribs arranged in axial direction on the cylinder wall so as to set the fluid in the cylinder in motion and expel it by centrifugal force through the ends of the cylinder, a ring-shaped disk fitted in said cylinder so as to obstruct the axial movement of the fluid at the circumference of the cylinder but allow such movement in the center thereof, the disk having open-ended slots to accommodate said ribs, and means for adjusting the disk in the cylinder so as to direct the flow toward either or both ends of the cylinder and so to regulate the movements of the vessel, substantially as set forth.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."