Aug. 9, 1927. 1,638,071

F. TRAVNICEK, ALSO KNOWN AS F. GRINESS

VACUUM PROPELLER

Filed July 21, 1924

Fig. 1.

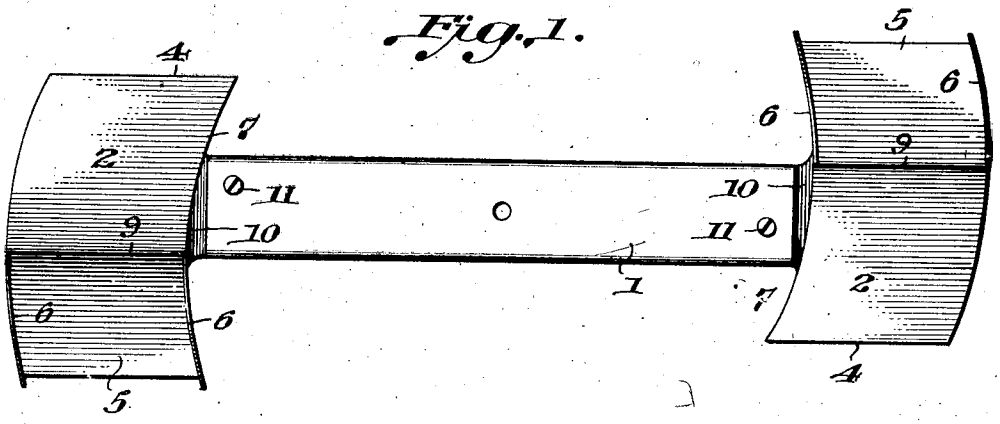


Fig. 2.

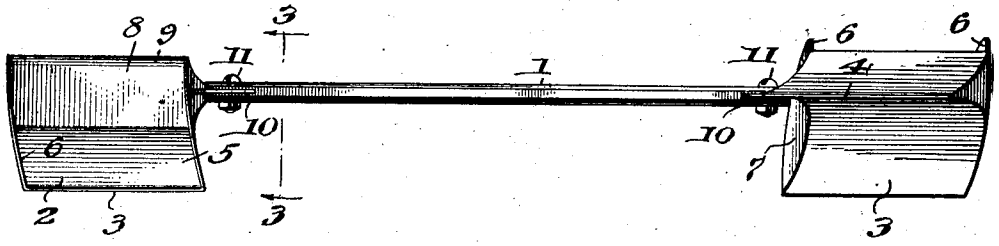


Fig. 3.

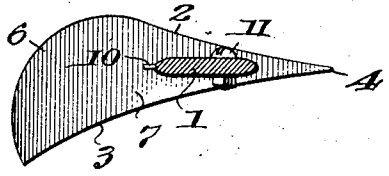
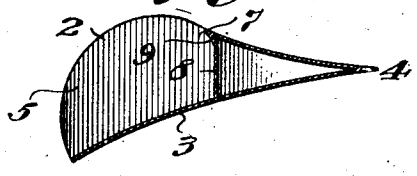


Fig. 4.



Inventor,

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By E. R. Hamilton Atty.

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UNITED STATES PATENT OFFICE.

FRANK TRAVNICEK, ALSO KNOWN AS FRANK GRINESS, OF EAST ST. LOUIS, ILLINOIS.

VACUUM PROPELLER.

Application filed July 21, 1924. Serial No. 727,192.

This invention relates to a propeller particularly adapted for exerting a lifting effect on a hydroplane when in the water.

The principle of my invention is that of the utilization of a partial vacuum due to the novel construction of the tips or blades of the propeller by which atmospheric pressure is obtained on one side of each blade or tip and suction or partial vacuum on the inside of the blade or tip. The result obtained is that atmospheric pressure and suction, produced by the rotation of the propeller, are exerted in the same direction, the fluid inside of the tips or blades having a tendency to lag, under the law of inertia, as the fluid in front of each blade is split or parted, depending upon the rate of revolution and the angle of incidence.

The effective surfaces on one side of each blade or tip, the smaller surface being uppermost, are considerably shorter and of less superficial area than the effective surfaces on the other side of each blade or tip, there being a compartment or pocket to the rear of each smaller effective surface. The surfaces are joined by a very thin edge to afford a sharp cutting action on the water, such surfaces diverging from each other. The blade or tip is, in each instance, canted so that blades are set angularly or "crossed" in respect to each other.

While I have described the propeller as adapted for use in water to exert a lifting action on a hydroplane, it is to be understood that other uses are comprehended and it is the principle of the invention, and not the specific use to which it is to be put, that is covered by the claims.

In the accompanying drawings:

Figure 1 is a plan view.

Fig. 2 is an edge view.

Fig. 3 is a section on line 3—3, Fig. 2; and

Fig. 4 is a longitudinal section through one of the propeller blades or tips.

The shank of the propeller appears at 1 and may be of any desired construction and mounted and driven in any fashion. In order that the air may pass unobstructed across the shank 1 between the blades or buckets the shank is flat and its edges are narrow to cut through the air with little resisitance.

The propeller blades or tips are duplicates and a description of one will suffice, it being understood, however, that they point in opposite directions and are canted in relation to each other, that is, they are set angularly in respect to each other.

Each propeller has a smaller top 2 than its bottom 3. The relative superficial areas of top and bottom may vary but in the embodiment shown in the drawings, the bottom 3 is of approximately twice the superficial area of the top surface 2. The top 2 and bottom 3 are slightly dished or curved, that is, on somewhat flat arcs and they converge to a thin cutting edge 4.

To the rear of the top 2 is a compartment or open topped chamber 5 whose bottom is the upper face of the bottom 3 and whose sides are the continuations 6 of the sides 7 which join the top and bottom surfaces 2 and 3. A wall 8 joins the top 2 and bottom 3 and constitutes one wall of the compartment 5, the upper part of the wall having an overhang 9.

The side walls, 6, 7, are curved, those of one blade or paddle curving the same as those of the other blade or paddle, that is, the general curvature of each blade or tip is in a direction toward the other blade or tip.

Each blade or tip has a wing 10 by which it is connected by a bolt 11 to the shank 1.

Viewed in end elevation, it will be seen that the dished top and bottom of each blade or tip is set at an angle, that is, somewhat cross wise, in relation to the other blade or tip.

When in operation, the effect is that of parting of the fluid by the edges 4 to a degree depending upon the rate of revolution and the angle of incidence to the surface. The direction of travel taken by the split fluid is more or less right angular to the plane of travel of the propeller. The larger surfaces 3 receive more fluid pressure than the upper surfaces 2. By reason of the side walls 6, the fluid cannot enter the compartment 5 when the propeller is in motion, that is, the inertia of the fluid will not permit it to flow into the compartment 5 from the sides and back and, due to the momentum of the fluid it will not enter from the top. A partial vacuum is thus formed due to the provision of the compartment 5 and such vacuum will be maintained as long as the propeller is in motion. The atmospheric pressure and suction are in the same direction. Now, if, for instance, the propeller be submerged in water and carried by a hydro-

plane and arranged to revolve horizontally, if the hydroplane is moving forward to a sufficient extent to cause the water to remain behind the propeller, a very material lifting effect upon the hydroplane will be produced by my propeller on account of the tendency of the atmospheric pressure to force the water inside the compartments 5.

I claim:

1. A lifting propeller having blades and an intermediate shank, each blade being hollow and open at its rear and of general wedge-shape, said blades being disposed angularly in relation to each other and each being adapted, by its construction, to create a partial vacuum.

2. A lifting propeller having blades, each of general wedge-shape disposed angularly in relation to each other and provided with open topped and closed side compartments having side walls and each adapted for producing a partial vacuum.

In testimony whereof I affix my signature.

FRANK TRAVNICEK,
Also known as Frank Griness.