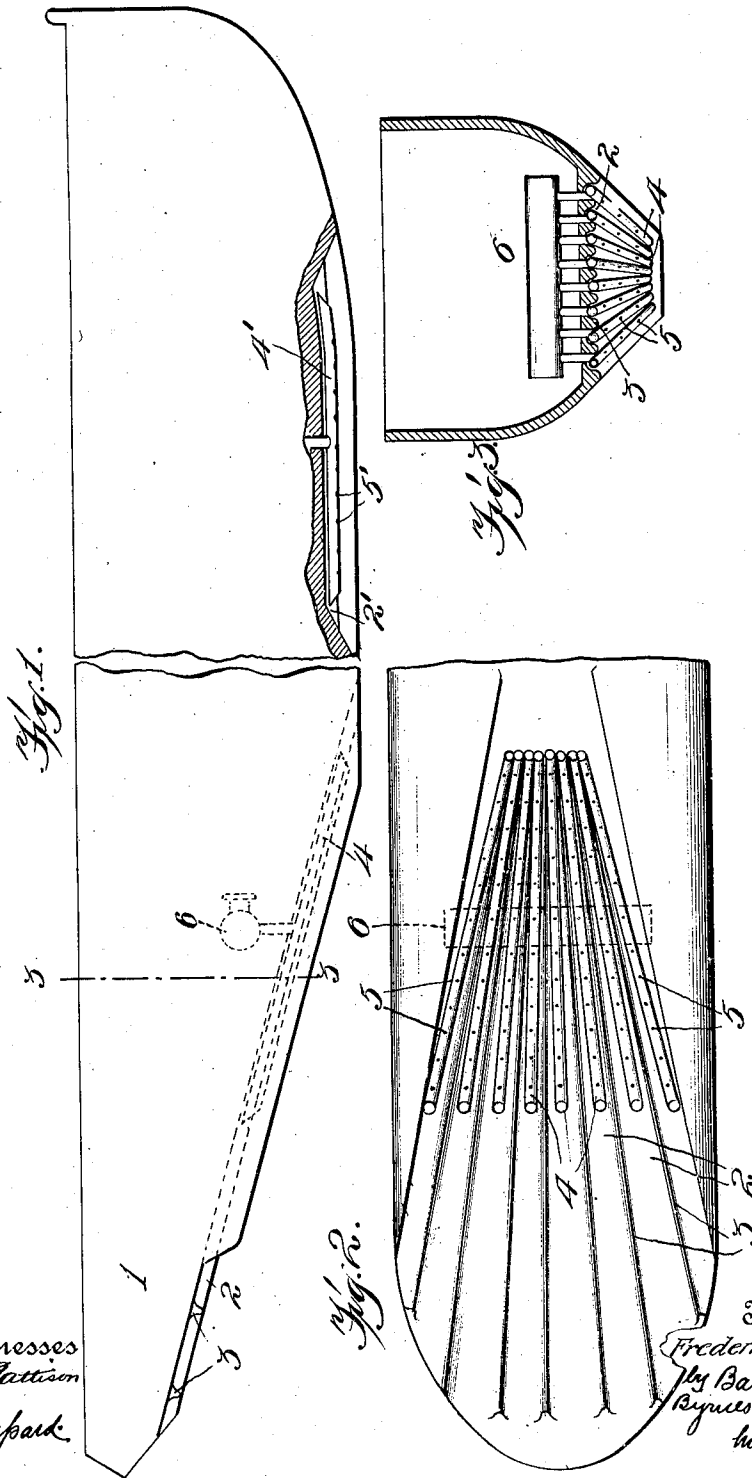


F. W. SCHROEDER.  
 PROPULSION OF VESSELS.  
 APPLICATION FILED AUG. 8, 1908.

955,214.

Patented Apr. 19, 1910.



Witnesses  
*J. F. Patterson*  
*W. S. Shepard*

Inventor  
*Frederick W. Schroeder*  
 By *Bakewell,*  
*Rynes & Barnabee*  
 his Attorneys.

# UNITED STATES PATENT OFFICE.

FREDERICK W. SCHROEDER, OF LONDON, ENGLAND.

## PROPULSION OF VESSELS.

955,214.

Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed August 8, 1908. Serial No. 447,589.

*To all whom it may concern:*

Be it known that I, FREDERICK WILLIAM SCHROEDER, of the city and county of London, England, have invented a new and useful Improvement in the Propulsion of Vessels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a side elevation of a vessel equipped with the improvements of the present invention. Fig. 2 is a bottom plan view of the stern. Fig. 3 is a cross-sectional view on the line 3—3 of Fig. 1.

This invention relates to the propulsion of vessels, and has for its object to effect the same in a new and improved manner by means of air or gases under pressure acting directly against the water in such a manner as to propel the vessel by the impact of the air or gas against the body of the water, as fully described in my co-pending application filed July 17, 1907, Serial No. 384,183.

In addition to propelling the vessel, it is proposed to have the air or gas pressure tend to elevate the vessel and thereby lessen the displacement thereof, which, of course, tends to increase the speed of the vessel and enables the convenient handling thereof in shoal waters. By reason of the lifting effect of the present invention, it is especially adapted for deep-draft vessels, because of the reduction in displacement without effecting its carrying capacity, and because it enables the handling of the vessel in relatively shoal waters where under ordinary circumstances it would be practically impossible to navigate.

To illustrate the application and operation of the present invention, there has been shown at 1, in the accompanying drawing, the stern portion of any ordinary or preferred form of vessel. As usual, the bottom of the stern is inclined upwardly and rearwardly, and upon this inclined bottom portion of the stern there is provided a series of channels 2 disposed fore and aft and having their opposite ends open for the free passage of water therethrough. While the drawing shows the channels as formed directly in the hull, thereby producing integral keels 3 separating the channels, I, of course, contemplate producing the channels by means of separate keels attached to the vessel in any suitable manner. As best indicated in Fig. 2 of the drawing, it will be

noted that each channel tapers forwardly so as to give a clearance for the gas or air under pressure as will hereinafter appear.

In each channel is a propulsion tube 4 which is closed at each end, its forward end being tapered downwardly and rearwardly and its aft end rearwardly and upwardly so as to decrease the resistance of the tube against the water when the vessel is in motion. Throughout the bottom of each tube there is provided a longitudinal series of perforations 5 through which the gas or air under pressure is adapted to escape against the body of the water. It will, of course, be understood that these openings or perforations incline downwardly and rearwardly so as to impart a forward movement to the vessel when the air or gas under pressure is discharged through the openings against the body of water. Each propulsion tube is in communication with a header or tank, such, for instance, as indicated at 6, which is designed to be supplied with air or gas under pressure by any suitable pressure generating apparatus, the latter not being shown in the drawings as it forms no part of the present invention. For an understanding of one embodiment of means for supplying pressure to the tank or header, reference is had to my co-pending application hereinbefore enumerated.

In practice, air under pressure being admitted to the tank or header 6, is communicated to the several tubes, from which it escapes downwardly and rearwardly through the perforations 5 against the body of water in which the vessel floats, whereby the latter will be driven forwardly. In addition to the propelling tendency of the escape of the air or gas under pressure, there is also a lifting tendency due to the direction of impact of the pressure against the water, and as this lifting tendency is applied to the stern of the vessel, it is applied at the most effective portion of the hull and decreases the draft of the stern portion of the vessel sufficiently to materially decrease the drag which is ordinarily present.

The advantage of having the propulsion tubes situated in channels is that they are not only protected against damage by driftwood and when striking upon a bar or shoal, but the air or gas under pressure is confined against immediate lateral expansion and is compelled to travel rearwardly through the channel, thereby effecting its utmost propel-

ling power. Moreover, the channels increase in cross-sectional area rearwardly so as to permit of the gradual lateral expansion of the air or gas under pressure as the latter travels rearwardly, thereby providing for the necessary clearance and enabling the pressure to escape through the rear open ends of the channels without causing any material disturbance in the water.

10 For the purpose of propelling the vessel astern, a suitable number of propulsion tubes 4' are situated beneath the forward portion of the hull in longitudinal open-ended channels 2'. These tubes are connected in any  
15 suitable manner with the source of gas or air under pressure. The perforations 5' of the tubes 4' are inclined downwardly and forwardly, so that when the fluid pressure escapes through these perforations the vessel will be propelled astern.

20 Having thus described the invention, what I claim is—

1. Apparatus for propelling deep draft vessels consisting of a vessel having a series  
25 of grooves extending aft on the inclination

of the stern, a longitudinally arranged tube in each groove, said tubes having openings therein directed oppositely to the direction of propulsion, said grooves comprising air chambers increasing in cross sectional area  
30 as they extend aft, and means for propelling the vessel by forcing air or gas through said tubes, substantially as described.

2. A deep draft vessel having its hull provided with external submerged grooves, one  
35 series being located toward the bow, and a second series being located toward the stern, said second series being of increasing diameter as they extend aft, longitudinally arranged tubes in said grooves and having  
40 openings therein directed oppositely to the direction of propulsion, substantially as described.

In testimony whereof I have hereunto set my hand.

F. W. SCHROEDER.

Witnesses:

OLIVER IMRAEL,

OLIVER Y. IMRAY.