To all whom it may concern:

Be it known that I, HAROLD E. YARROW, of Glasgow, Scotland, have invented certain new and useful Improvements in Propeller Chambers or Tunnels for Shallow-Draft Vessels, of which the following is a specification.

This invention relates to shallow draft vessels having screw propellers which are accommodated within cavities or tunnels formed in the lower part of the hulls, the propellers being of such diameter that the blades extend above the level of the external water.

As described in the specification to British Letters Patent No. 967 of 1897, such cavities have been made with their upper side or roof sloping downward each way, forward and aft from the propeller, and in order to reduce as much as possible the resistance opposed to the issue of the water from the cavity toward the stern, the rearward slope has been made to terminate at or near the water line and means have been provided whereby this rearward slope can be altered so as to insure this condition at all drafts, by hinging the shell or flap constituting this slope and providing means for raising and lowering it as may be found necessary.

In the specification to British Letters Patent No. 28728 of 1911, arrangements are described by which the shell or flap is completely or partly balanced so as to enable it to be raised automatically and maintained in a raised position by the sternward flow of water from the propeller.

The present invention consists in the improvement by which plates at the sides of the tunnel, herein referred to as curtain plates, are carried down to the level of the bottom of the boat, with the object of sealing the cavity in which the propeller works in case the stern was raised out of the water by an alteration of the trim of the boat. This might arise, more especially in gun boats, if one or more of the fore compartments were damaged by hostile fire or other causes, and in this case without the provision of curtain plates according to the invention, the propeller would not work effectively.

When these vessels are required to take up a given position, without anchoring or making any connection with the shore, it has been found that they are liable to be acted upon by a wind, so that the bow moves side-wise more quickly than the after part of the vessel; this position in which the bow is pointing in a direction away from the wind, is not favorable for maneuvering. To overcome this difficulty it is necessary to add some side-wise resistance at the bow and to reduce the side-wise resistance at the stern to a minimum.

With the object of reducing this side-wise resistance of the stern the curtain plates have been arranged to either draw up into the boat or fold up against the bottom of the boat, as shown in Figures 3, 3a, 4, 4a, 5 and 5a.

The accompanying drawings illustrate, by way of example, constructions according to the invention; Figs. 1 and 1a are respectively a diagrammatic longitudinal section and an end elevation of a vessel, showing the flaps and curtains provided, if required, with means for raising the flap. Figs. 2 and 2a are similar views in which the bottom plates of the vessel are extended downward to form the curtain plates. Figs. 3 and 3a show a modification in which the curtain plates can be drawn vertically upward. In the arrangement shown in Figs. 4 and 4a the curtain plates are hinged so as in their raised positions to lie against the bottom of the vessel. In the modification shown in Figs. 5 and 5a the curtain plates and flaps are combined together so as to be raised by the same operating gear.

The same reference letters are used for similar parts in all the figures.

A is the flap, which can be drawn up so as to lie against the top B of the tunnel in which the propeller works. C, C are the curtain plates extending approximately to the lowest level of the bottom D of the vessel.

In Figs. 1 and 1a, E is the operating gear which may be fitted for raising the flap A.

In Figs. 2 and 2a, the bottom plating D of the vessel is extended downward to form the curtain inclosing the sides of the tunnel.

In Figs. 3 and 3a the curtain plates C hinged at F can be raised by the operating gear E into the position shown by the dotted lines.

In Figs. 4 and 4a the curtain plates C...
hinged at F' can be raised by the gear E so as to lie against the bottom of the boat, as shown by the dotted lines.

In Figs. 5 and 5', the curtain plates C and flap A are combined and are balanced by a weight H which is suspended by a cord from the pulley E, so that they can be raised together automatically about the hinge F' by the sternward flow of water from the propeller tunnel.

In all the constructions in which the curtain plates or flaps are capable of being set either in the raised or lowered position, this operation may be effected by hand, or as described in specification to British Letters Patent No. 258,262 of 1911, the moving parts may be balanced partially or completely, so that they are in their lowest position when the vessel is stationary, but as soon as the engines are started and the tunnel fills with water, the curtain plates and flaps automatically rise into the positions in which they offer the least resistance to the sternward flow of water.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:

1. A propeller tunnel for a shallow draft vessel, comprising a roof sloping downward both toward the bow and the stern, a hinged flap terminating at the rearward slope near the water line, and curtain plates extending vertically downward at each side of the tunnel from the top of the rearward end of the tunnel to approximately the level of the bottom of the vessel.

2. A propeller tunnel for a shallow draft vessel, comprising a roof sloping downward both toward the bow and the stern, a hinged flap terminating at the rearward slope near the water line, and curtain plates extending vertically downward at each side of the tunnel from the top of the rearward end of the tunnel to approximately the level of the bottom of the vessel; in combination with means for raising the said curtain plates in order to lessen the resistance to movement through the water.

3. A propeller tunnel for a shallow draft vessel, comprising a roof sloping downward both toward the bow and the stern, a hinged flap terminating at the rearward slope near the water line, and curtain plates extending vertically downward at each side of the tunnel from the top of the rearward end of the tunnel to approximately the level of the bottom of the vessel; in combination with means for raising the said curtain plates about horizontal hinges, so that they lie against the bottom of the vessel.

4. A propeller tunnel for a shallow draft vessel, comprising a roof sloping downward both toward the bow and the stern, a hinged flap terminating at the rearward slope near the water line, and curtain plates extending vertically downward at each side of the tunnel from the top of the rearward end of the tunnel to approximately the level of the bottom of the vessel; in combination with means for raising and lowering together the curtain plates and the hinged flap.

5. A propeller tunnel for a shallow draft vessel, comprising a roof sloping downward both toward the bow and the stern, a hinged flap terminating at the rearward slope near the water line, and curtain plates extending vertically downward at each side of the tunnel from the top of the rearward end of the tunnel to approximately the level of the bottom of the vessel, the said plates and flap being balanced so as to be automatically raised by the sternward flow of the water in the propeller tunnel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HAROLD E. YARROW.

Witnesses:

JAMES RTCHE,
W. EASTON ROBERTS.

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