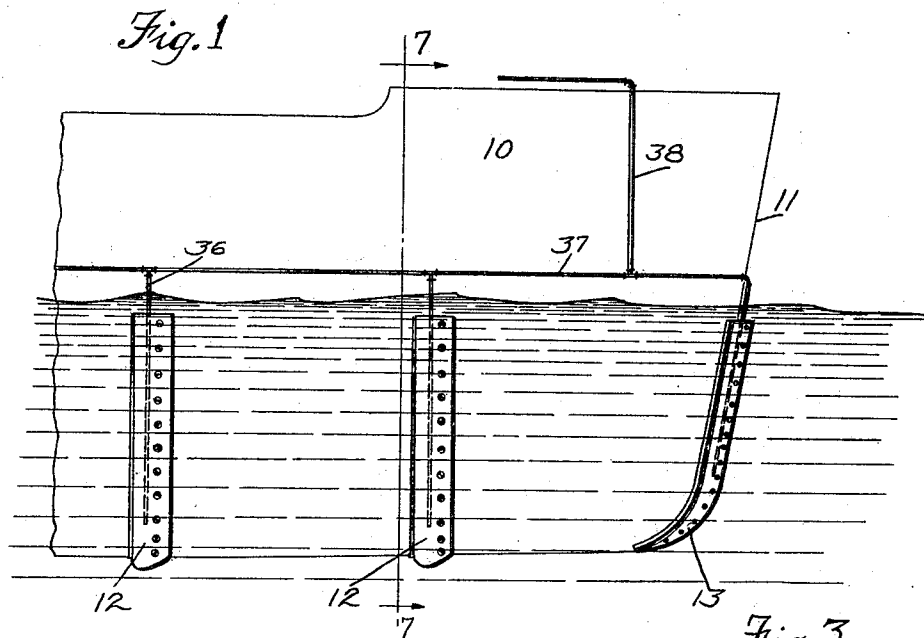
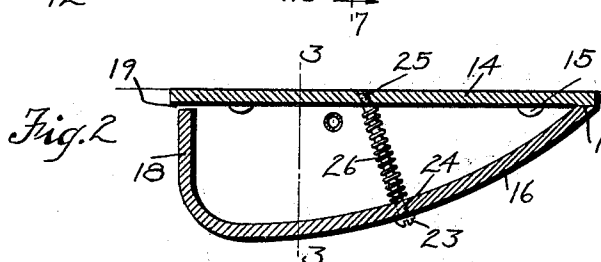
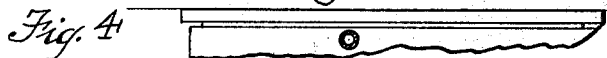
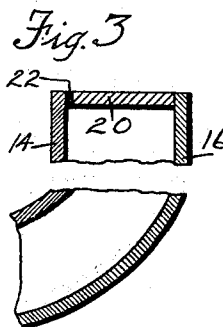
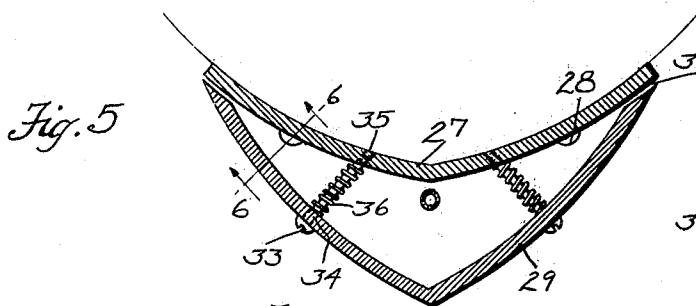
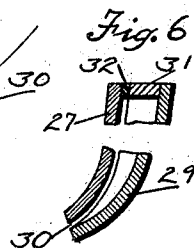
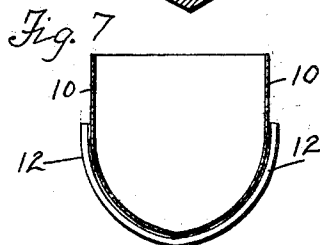


F. G. TRASK.
 APPARATUS FOR SUPPLYING AIR TO THE EXTERIOR OF HULLS OF SHIPS.
 APPLICATION FILED MAY 27, 1919.

1,398,246.

Patented Nov. 29, 1921.



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APPARATUS FOR SUPPLYING AIR TO THE EXTERIOR OF HULLS OF SHIPS.

1,398,246.

Specification of Letters Patent. Patented Nov. 29, 1921.

Application filed May 27, 1919. Serial No. 300,108.

To all whom it may concern:

Be it known that I, F. G. TRASK, a citizen of the United States, residing at Ross, in the county of Mountrail and State of North Dakota, have invented new and useful Improvements in Apparatus for Supplying Air to the Exterior of Hulls of Ships, of which the following is a specification.

The present invention relates to apparatus for supplying air to the exterior surface of the hull of a ship, beneath the level of the water, to reduce the friction between the hull and the water whereby the speed of the ship is greatly increased.

An important object of the invention is to provide apparatus of the above mentioned character, which is adapted to supply a sheet of compressed air to the exterior of the hull of the ship, in contact therewith or in proximity thereto, and which apparatus is adjustable to vary the thickness of the sheet of air.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of apparatuses embodying my invention, showing the same applied to the hull of a ship,

Fig. 2 is a horizontal section taken through one of the side apparatuses.

Fig. 3 is a longitudinal section taken on line 3—3 of Fig. 2,

Fig. 4 is a fragmentary plan view of the side apparatus,

Fig. 5 is a horizontal section through the bow apparatus,

Fig. 6 is a longitudinal section taken on line 6—6 of Fig. 5.

Fig. 7 is a transverse section through the hull.

In the drawings, the numeral 10 designates the hull of a ship, and 11 the forward end or bow.

Extending around the sides and bottom of the hull at spaced intervals are side apparatuses or units 12, and the numeral 13 designates a bow apparatus or unit, secured to the bow 11.

Each apparatus or unit 12 embodies a casing including an inner plate 14, which is bolted or otherwise secured to the hull 10, as shown at 15. The plate 14 is suitably curved

longitudinally to conform to the curvature of the hull and extends transversely around the bottom of the hull. The inner plate 14 carries an outer shell 16, transversely curved, as shown, and having its forward edge welded or otherwise secured to the plate 14 for providing an air tight joint. This outer shell is longitudinally curved and extends around the bottom of the hull. The rear end portion 18 of the shell 16 is bent laterally and is disposed at substantially a right angle to the plate 14, and is spaced therefrom to provide an elongated air outlet 19. The shell 16 embodies end closures or members 20, which are adapted to contact with sections of rubber 22, or like material to form an air tight joint with the plate 14 at the two ends of the unit. It is thus seen that the casing is completely closed except for the opening or slot 19.

The numeral 23 designates adjusting pins or elements, rotatable in openings 24, and having their inner ends screw threaded to engage within screw threaded openings 25, formed in the plate 14. Compressible coil springs 26 surround the pins 23, and tend to move the shell outwardly. It is thus seen that by turning the pins 23 the thickness of the slot or opening 19 may be varied.

The bow apparatus or unit 13 embodies an inner plate 27, which is curved transversely and longitudinally, the same being approximately V-shaped in cross section, to straddle the bow 11, and is secured thereto by bolts or rivets 28. The inner plate 27 carries an outer shell 29, also longitudinally curved and formed V-shaped in cross section. This outer shell has its edges spaced from the plate 27 forming longitudinal openings or slots 30, for the escape of air, which opening extends at the bottom of the shell 29 as clearly shown in Fig. 6. As shown in Fig. 6 the shell 29 carries a top 31, adapted to contact with a section of rubber 32, secured to the plate 27, to form an airtight joint therewith. It is obvious that the air can only discharge through the opening or slot 30. The thickness of this slot may be adjusted by pins 33, which are rotatable within openings 34, and these pins have their inner ends screw threaded to engage within screw threaded openings 35. The pins 33 are surrounded by compressible coil springs 36. The width of the slot 30 may be adjusted by turning the pins 33, as is obvious.

Compressed air is supplied to the casings

of the several units through pipes 36, which pass through openings in the tops 20 and 31, and form an airtight joint therewith. These pipes are connected with a pipe 37, having connection with a pipe 38, which leads to a source of compressed air.

From the foregoing description it will be seen that the several units serve to supply sheets of compressed air to the exterior surface of the hull, which serves to materially reduce the friction between the hull and water.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes may be resorted to, in the shape, size, and arrangement of parts, without departing from the spirit of my invention or the scope of the subjoined claims.

The apparatus may, of course, be used on vessels of various types. Being intended primarily for the purpose of increasing the speed of the vessel in connection with which the apparatus is used, the sheet of air would ordinarily not be applied except at higher speeds.

Having thus described my invention I claim:

1. In apparatus of the character described, an inner plate curved longitudinally to conform to the curvature of the hull of the ship and secured thereto, an outer shell arranged near the plate and extending in proximity thereto throughout substantially its entire length, said outer shell having one edge thereof spaced from the plate to provide an air discharge slot, said outer shell having a top, a strip of elastic material carried by the top and adapted to engage with the inner plate, a set of pins connected with the outer shell and having screw-threaded engagement with the inner plate, and compressible coil springs surrounding the pins and arranged between the outer shell and the inner plate, and means to supply compressed air into the outer shell.

2. In apparatus of the character described, an inner plate curved longitudinally to conform to the curvature of the hull of a ship and

secured thereto, an outer shell arranged near the inner plate and extending longitudinally thereof in proximity thereto, said outer shell having one edge thereof spaced from the inner plate to provide an air discharge slot, a longitudinal set of spaced pins extending transversely through the outer shell and connected therewith and having screw-threaded engagement with the inner plate, and compressible coil springs surrounding the pins and arranged between the outer shell and inner plate, and means to supply compressed air into the outer shell.

3. Apparatus to be secured to the bow of the hull of a ship, comprising an inner plate formed approximately V-shaped in cross section to straddle the bow and be secured thereto, an outer shell arranged in advance of the plate and formed approximately V-shaped in cross section and having its longitudinal edges spaced from the plate to form air discharge slots, said outer shell comprising a top, a strip of elastic material carried by the plate to be engaged by the top, pins connected with the shell and having screw threaded engagement with the plate, and springs surrounding the pins, and means to supply air into the shell.

4. In apparatus of the character described, an inner plate formed approximately V-shape in cross section to straddle the bow of the ship and to be secured thereto, an outer shell arranged in advance of the plate and formed approximately V-shape in cross section and having its longitudinal edges spaced from the plate to form air discharge slots, longitudinal sets of pins arranged upon opposite sides of the apex of the outer shell and connected therewith and having screw-threaded engagement with the inner plate, coil springs surrounding the pins and disposed between the outer shell and inner plate, spaced shells arranged rearwardly of the first named shell and extending transversely about the bottom of the boat and having rearwardly discharging air slots, and means to supply compressed air to all of said shells.

F. G. TRASK.