July 6, 1926. 1,591,748

F. C. DIECKMANN

ATTACHMENT FOR BOATS

Filed August 22, 1924 2 Sheets-Sheet 1

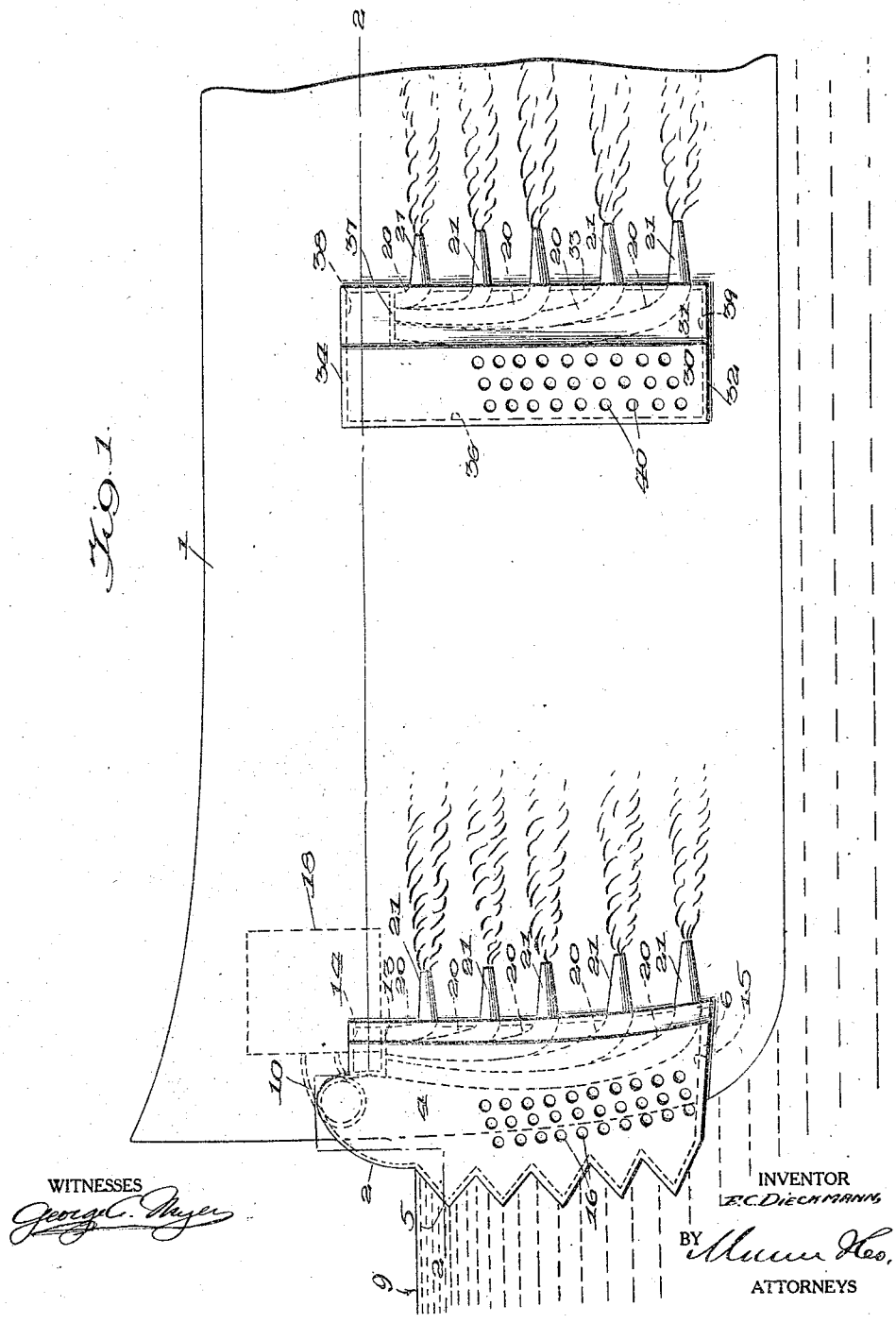


Fig. 1.

WITNESSES

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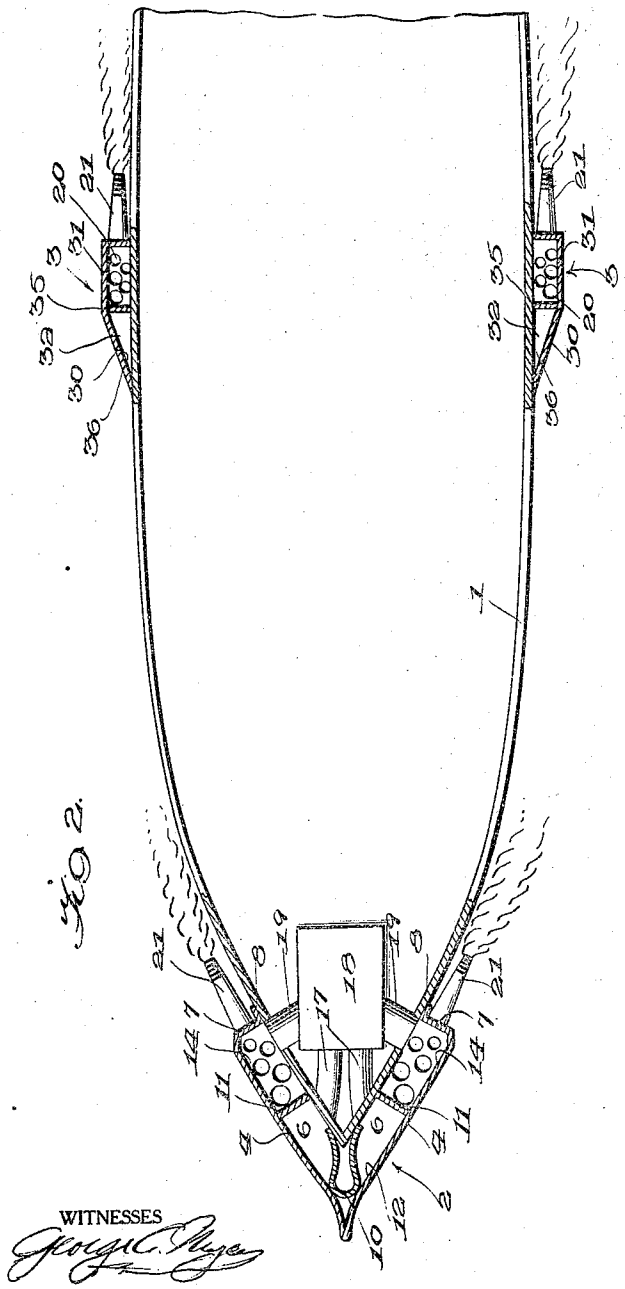


Fig. 2.

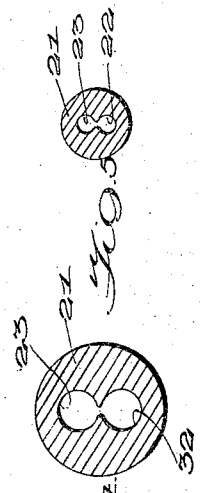


Fig. 4.

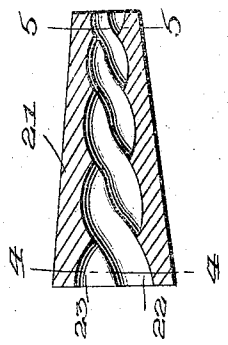


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR BOATS.

Application filed August 22, 1924. Serial No. 733,621.

My invention is a device attachable to the hull of a boat and affording facilities for protecting the hull of a boat against friction resulting from the impact of water thereagainst as the boat moves through the water.

An object of the invention is to provide an attachment of the character described which is adapted to discharge rapidly whirling currents of water rearwardly along the sides of the hull of a boat to which the device is attached for the purpose of deflecting outwardly from the sides of the hull of the boat water which otherwise would impinge with relatively great force against the hull of the boat.

A further object of the invention is the provision of a device of the character described which includes a unit attachable to the prow of the boat and extending below the water line for deflecting the water outwardly from the sides of the hull of the boat as the boat moves forward so that but relatively little resistance will be opposed to the forward movement of the boat through the water.

A further object of the invention is the provision in a device of the character described of a novel nozzle for discharging a rapidly whirling stream of water rearwardly along the side of the hull of the boat.

Other objects and advantages will be apparent from the following description, considered in conjunction with the accompanying drawings, in which

Figure 1 is a side elevation of the forward portion of the hull of a boat equipped with a practical embodiment of the invention,

Figure 2 is a section along the line 2—2 of Figure 1,

Figure 3 is a longitudinal vertical section through one of the nozzles which are comprised in the device,

Figure 4 is a section along the line 4—4 of Figure 3,

Figure 5 is a section along the line 5—5 of Figure 3.

In Figures 1 and 2, the forward portion of the hull of a boat designated 1 is shown. An attachment embodying the invention comprises a front protecting unit 2 and a pair of lateral protecting units 3.

The front unit 2 comprises a casing which is substantially V-shaped in cross section and comprises a pair of side members 4 which are bent slightly forward adjacent to their juncture with each other and are merged or joined together to provide a relatively sharp vertical edge 5 which is serrated or notched from its lower end nearly to the upper end thereof as clearly shown in Figure 1. The sides 4 are provided at their lower ends with inwardly extending flanges 6 of uniform width which are merged one into the other in the vertical plane of the juncture of the sides 4 of the outer casing of the front unit. The sides 4 also are provided at their rearward ends with inwardly extending flanges 7 of approximately the same width as the flanges 6. The flanges 7 are merged at their lower ends into the bottom flanges 6 and are formed with laterally turned attaching portions 8 at their inner edges. The casing of the front unit is positioned at the prow of a boat with the respective flanges 6 in straddling relation to the prow of the boat hull and in abutting relation to the forward portion of the sides of the boat hull and with the attaching portions 8 of the flanges 7 flatwise against the opposite sides of the boat hull and secured to the latter by any suitable known fastening means, none being shown in the drawings. With the arrangement just described, the respective sides 4 of the casing of the front unit will be positioned in spaced parallel relation to the forward portions of the corresponding sides of the boat hull and the line of juncture of the sides 4 with each other will be located in advance of the line of juncture of the sides of the boat hull and in the longitudinal axis of the boat. It also will be understood that the casing of the front unit is attached to the boat hull so that the major portion of the casing will be below the water line, indicated at 9 in Fig. 1. The casing of the front unit may be stayed to the boat hull by a substantially U-shaped brace member 10 which has the web portion thereof secured to the sides 4 adjacent to their juncture with each other and has the arms thereof secured to the sides of the boat hull at the prow of the boat.

The space between the sides 4 of the casing and the boat hull is divided by a pair of vertical partitions 11 into a front compartment, indicated at 12 and a pair of lateral compartments. Each of the lateral compartments is divided by a horizontal partition 13 into an upper chamber 14 and a lower chamber 15. Each of the sides 4 is

provided below the water line 9 with apertures 16 which open into the front compartment 12. Intake tubes 17 lead from the upper part of compartment 12 to a pump which is shown diagrammatically at 18. Discharge tubes 19 lead from the pump 18 to the chambers 14. Delivery tubes 20 are in open communication at their upper ends with the interior of the chambers 14 and extend through the chambers 15 to nozzles 21 which are carried by the flanges 7 in vertically spaced relation below the water line 9 and extend rearwardly along the sides of the hull of the boat. The delivery tubes 20 therefore are of different lengths, since there is a delivery tube 20 for each nozzle 21 and the length of the delivery tube of course will vary according to the position of the nozzle 21 to which it is connected in the vertical series, there being a vertical series of nozzles 21 at each side of the hull of the boat.

Each of the nozzles 21 tapers externally toward its rearward end and the respective nozzles 21 differ from one another only in that the size of the nozzles increase regularly in size from the uppermost to the lowermost nozzle of the series. Each nozzle 21 is provided with a longitudinal passage extending therethrough, this passage being formed of two spiral bores indicated at 22 and 23 respectively which extend through the nozzle in longitudinally intersecting relation, each of the bores 22 decreasing regularly in cross sectional area from the inner end of the nozzle to the outer end thereof.

The operation of the front unit is substantially as follows: Water enters the intake compartment 12 through the apertures 16 and is drawn through the intake pipes 17 to the pump 18. Thence, the water is discharged within the delivery chamber 14 and through the delivery pipes 20 into and through the nozzles 21. Since the passages 22—23 of the nozzles decrease in cross sectional area toward their outer or rearward ends and each of the passages is formed of two longitudinally intersecting spiral bores, it will be manifest that streams of water will be discharged from the nozzles at high velocity and in whirling or twisting form. These whirling streams of water will move rearwardly along the sides of the boat hull and will deflect water which would otherwise impinge against the sides of the boat hull outward from the boat hull, thus reducing friction beyond the ordinary and also reducing the resistance which is opposed to the forward movement of the boat in the water.

Each of the side units 3 comprises a casing including a side plate which consists of two angularly related portions 30 and 31 respectively. The side plate has a bottom flange 32, a rear flange 33 and a top flange 34, whereby it may be attached to one of the sides of the boat hull so that the portion 31 of the side plate will be disposed in substantially parallel relation to the adjacent side of the boat hull and the portion 30 of the side plate will extend inwardly and forwardly from its juncture with the portion 31 to the plane of the adjacent side of the boat hull. The space between the side plate 30—31 and the adjacent wall of the boat hull is divided by a vertical partition 35 into a forward compartment 36 and a rearward compartment, the rearward compartment being divided by a horizontal partition 37 into an upper compartment 38 and a lower compartment 39. The side of the forward compartment 36 is the portion 30 of the side plate and it is provided with apertures 40 located below the water line. The rear flange 33 carries a vertical series of the nozzles 21 and delivery tubes 20 extend from the nozzles 21 to the upper rearward compartment 38. It will be understood that the upper compartment 38 may be connected in any suitable known manner to the delivery side of a pump and the compartment 36 is connected to the intake side of the pump, neither the pump nor the intake and discharge tubes thereof being shown in the drawings in association with the side units 3.

The operation of each side unit 3 is identical in essential respects with the operation of the front unit 2.

I claim:—

1. A device of the character described comprising a casing attachable to the hull of a boat in position to extend below the water level, a plurality of nozzles carried by said casing, said nozzles extending rearwardly alongside of the boat hull and being adapted for connection with a source of fluid supply.

2. A device of the character described comprising a casing attachable to the hull of a boat in position to extend below the water level, a plurality of nozzles carried by said casing, said nozzles being arranged in a vertical series below the water level and extending rearwardly along a side of a boat hull.

3. A device of the character described comprising a casing attachable to the hull of a boat in position to extend below the water level, a plurality of nozzles carried by said casing, said nozzles being arranged in a vertical series below the water level and extending rearwardly along a side of a boat hull, each of said nozzles having a longitudinally extending passage tapering in cross sectional area toward its rearward end, each of said passages being formed of two spiral cores extending through the body of the nozzle in longitudinally intersecting relation.

4. A device of the character described

comprising a casing attachable to the hull of a boat in position to extend below the water level, a plurality of nozzles carried by said casing, said nozzles being arranged in a vertical series below the water level and extending rearwardly along a side of a boat hull, each of said nozzles having a longitudinally extending passage tapering in cross sectional area toward its rearward end, said nozzles decreasing in size regularly from the lowermost nozzle to the uppermost nozzle of the series.

5. In a device of the character described, a nozzle comprising an elongated body having a longitudinally extending passage, said passage being formed of two longitudinally extending spiral bores extending through the body in longitudinally intersecting relation.

6. A device of the character described comprising a casing attachable to the prow of a boat to extend beneath the water line and having a pair of side flanges extending from the line of juncture of the sides of the boat rearwardly along said sides, the side members of the casing being prolonged forwardly of the prow of the boat at the juncture of said side members terminating in a substantially vertical edge, said edge being serrated, and a vertical series of vertically extending spaced apart nozzles carried by each of said side members of the casing and adapted for connection with a source of pressure fluid supply, the side members of said casing having marginal inwardly extending flanges adapted to abut the sides of the boat hull and space said side members from the sides of the boat hull, a vertical partition arranged between the side members and the sides of the boat, thus dividing the space between each side member of the casing and the hull of the boat into a front compartment and a rear compartment, a horizontal partition dividing said rear compartment into an upper compartment and a lower compartment, said front compartment having ports therethrough located beneath the water line and being adapted at its upper end for connection with the intake side of a pump, the uppermost of said rear compartments being adapted for connection with the discharge side of the pump, and tubes extending from the uppermost of the rear compartments to said nozzles.

7. In a device of the character described, a unit comprising a casing having a side plate attachable to the side of a boat hull and divided vertically into two angularly related portions, one of said portions being parallel with the side of the boat hull and the other of said portions being inclined from its juncture with the front portion to the plane of the side of the boat hull, said second portion of the side plate having apertures therethrough located beneath the water line, a horizontal partition disposed between the first portion of the side plate and the hull of the boat, a vertical partition cooperating with said horizontal partition, said side plate and the hull of the boat to provide a compartment between the upper part of the first named portion of the plate and the hull, a series of nozzles carried by a vertical flange at the rearward end of the first named portion of the side members, and tubes extending between said side plate of the casing and the boat hull for connecting said nozzles to the said compartment.

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