J. L. Jurgens. Sheet 1, 2 Sheets.

Armor Clad.

No. 39,408. Patented Aug. 4, 1863.

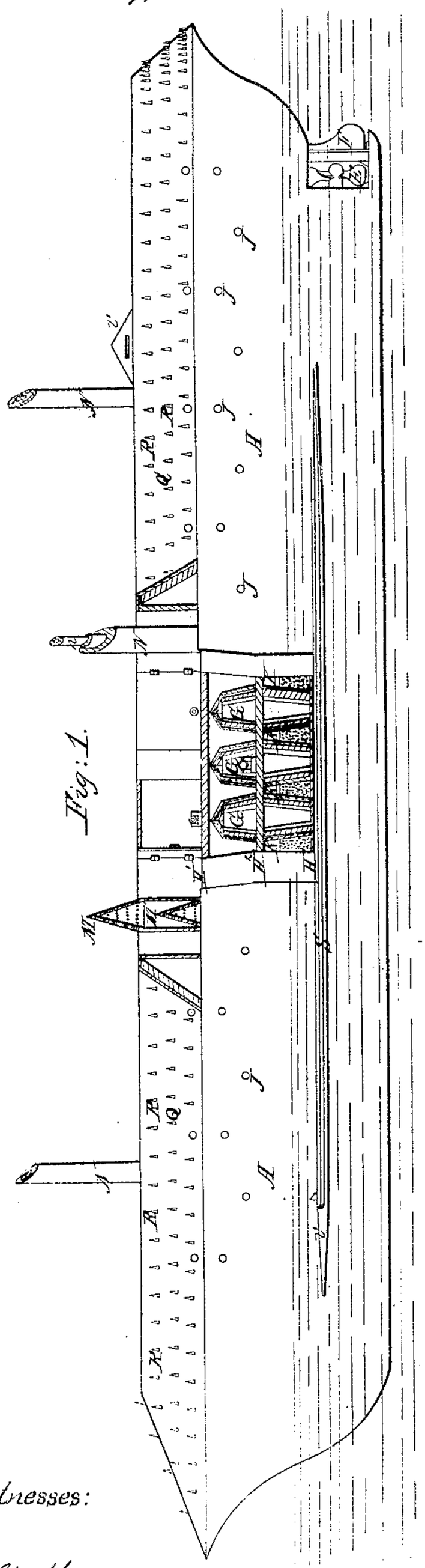

Fig: 1.

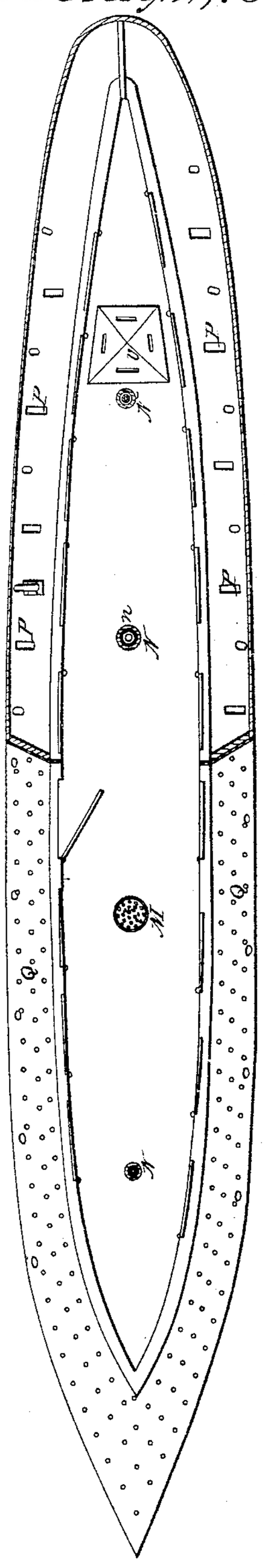

Fig: 2.

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D. Gherkin
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Inventor:

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J. L. Jurgens. Sheets, 2 Sheets.

Armor Clad.

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Fig: 5.

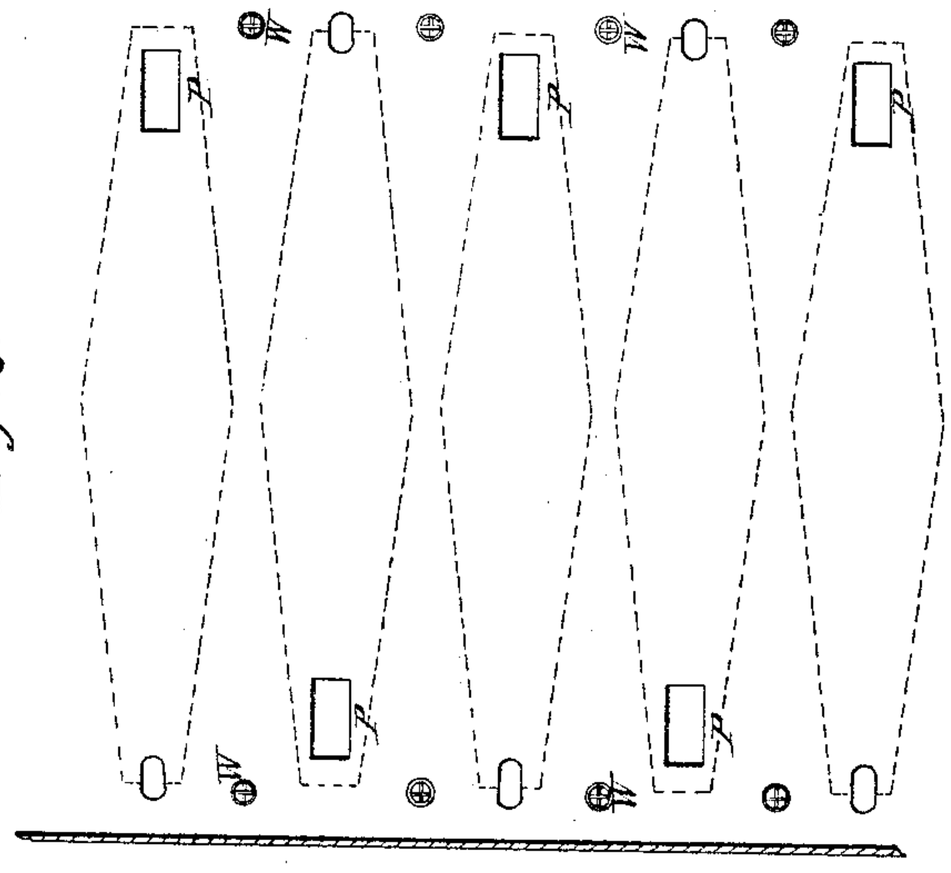


Fig: 3.

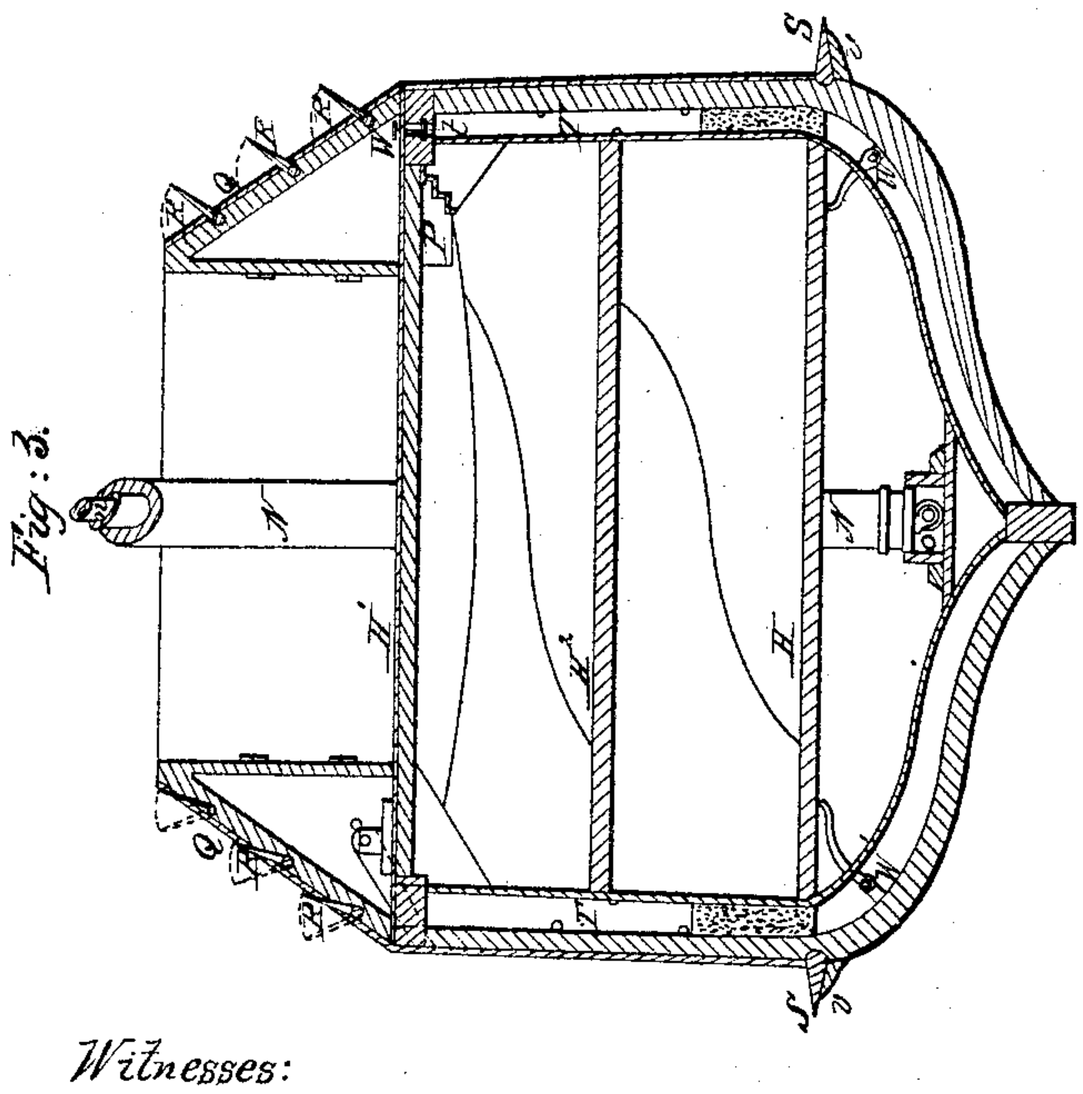
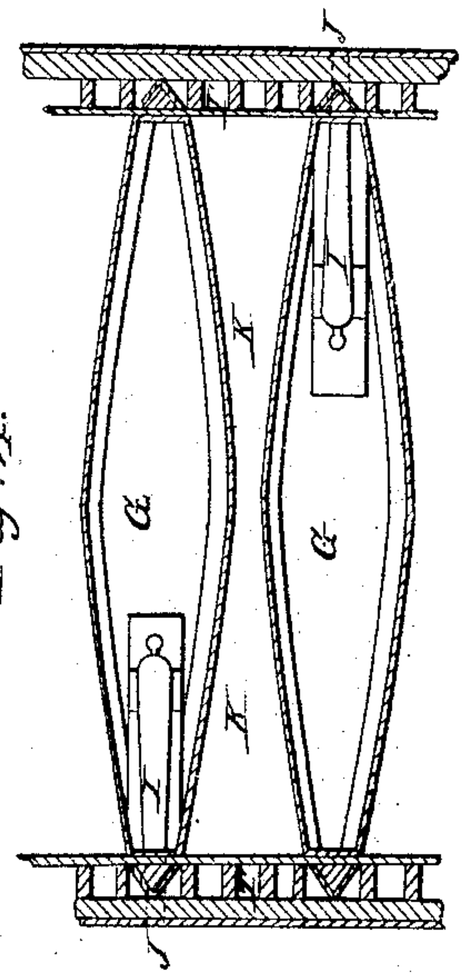


Fig: 4.



Witnesses:

Charles Smith
J. Schreiter

Inventor:

J. L. Jurgens

UNITED STATES PATENT OFFICE.

JÜRGEN L. JÜRGENS, OF THE ISLE OF FÖHR, DENMARK, ASSIGNOR TO HIMSELF AND JOHN E. HOOVER, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN VESSELS OF WAR.

Specification forming part of Letters Patent No. **39,408**, dated August 4, 1863.

To all whom it may concern:

Be it known that I, JÜRGEN L. JÜRGENS, of the Isle of Föhr, in the Kingdom of Denmark, have invented certain new and useful Improvements in War-Vessels; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of the vessel, partly in section. Fig. 2 is a plan of the same, partly in section. Fig. 3 is a vertical transverse section. Fig. 4 is a horizontal section at *x x*. Fig. 5 is a horizontal section at *y y*.

Similar letters of reference indicate corresponding parts in the several views.

The primary object of this invention is to so construct a vessel that she may be penetrated by shot without injury to her vital parts, machinery, armament, or crew. This object is accomplished by forming that part of the ship above the water-line and below the upper deck with a series of oblique-sided chambers passing transversely through the ship, wide at the center and converging toward each side. The spaces between the said chambers will thus be funnel-shaped, converging from each side toward the center. The sides of the chambers are covered with metallic armor of moderate thickness laid upon wooden sheathing with a body of india-rubber or other elastic material placed between. The top of the chambers are also metal-plated, and incline downward at their ends toward the sides of the ship. In the lower parts of the spaces between the aforesaid chambers are masses of cork or other light material, extending up to the water-line, so that in the event of the spaces being pierced by shot no more water can enter than will fill the space traversed by the shot, and thus the buoyancy of the vessel will be but slightly interfered with. The masts are constructed in tubular form, with a central tube of iron and a body of india-rubber, cork, or analogous material interposed between the said tube and the outer shell of the mast. The step on which the central tube rests constitutes a swivel on which the tube may turn freely, so that any shot striking the tube on either side of its exact center will turn it within its elastic case, and thus glance off. To increase the elasticity of the surrounding material and the freedom with which the tube will turn, a small space is left between the tube and its casing. Above the upper deck are bulwarks, strongly iron-plated, projecting upward to a sufficient height and inclined inward from the perpendicular at a sufficient angle to protect men and boats upon deck from injury from an enemy's shot. The smoke-stacks are constructed of telescopic tubes, with perforated conical ends, and may be let down to a level with the bulwarks to preserve them from injury while in action. On the outside of the bulwarks are light iron bars running fore and aft, and furnished with projecting pikes to keep off boarders. The said pikes may be raised and lowered simultaneously by means of transverse connecting rods worked by hand or by machinery.

To protect the ship from the assaults of rams or other vessels, pivoted guard-wings are employed, projecting from the sides beneath the water. When not in use, the said wings lie in parallel positions against the sides of the ship, so as not to retard her motion, but they may be thrown outward at any suitable angle to sheer off the attack of a ram or other vessel, or to grapple and impede her motion and maneuvers. The space between the inner and outer skins of the ship is divided into water-tight compartments, from each of which a pipe rises to the upper deck. In the event of fire occurring in the lower part of the hull its locality will be indicated by smoke rising through one of the aforesaid pipes, and may be extinguished by pouring or forcing water down the pipe.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe it more particularly with reference to the accompanying drawings.

A represents the main body of the hull, which may have any suitable external form. The boilers and the engines are located at the bottom of the hold, entirely below the surface of the water.

E is the propeller, and F the rudder.

G G G are a series of oblique-sided shot-

proof chambers, extending vertically from the lower deck, H, to the upper deck, H′, and transversely from side to side of the ship. The walls of the said chambers converge from midships to the sides in both directions, as shown in Fig. 2, and from the vertical center both upward and downward, as shown in Fig. 1. The roofs of the aforesaid chambers incline at their outer ends down to the port-holes at the sides of the ship, and by these means it is rendered impossible for a missile to strike any part of the walls of the chambers in a line perpendicular to the surface. The mail-clad walls of these chambers are made secure and firm at their outer ends to prevent collapsing; but their intermediate portions are disconnected, as indicated by curved lines in Fig. 3, (their edges overlapping,) so as to give them a yielding character, and thus adapt them to more effectually ward off and deflect shot.

H^2 is an intermedate deck, extending continuously from stem to stern at the mid-height of the chambers G.

I I represent guns mounted on the deck H^2 within the chambers G, and pointing out through port-holes J J′ at the ends of the said chambers, two port-holes being used for each gun of the upper tier—one for horizontal and one for plunging shot. The spaces K K between the chambers are filled up to the water-line with masses of cork, as shown at L L in Fig. 1, in order that a shot penetrating the said spaces may cause the ingress of no more water than will fill the cavity made by the missile, and the water so entering will quench the fire of an incendiary shell.

M M represent smoke-stacks, consisting of telescopic tubes with conical ends and adapted to be lowered to a level with the top of the bulwarks when in action. Each of the said smoke-stacks passes upward through one of the chambers G, so as to be protected from injury.

N N are hollow masts of peculiar construction, which also pass upward within the protecting-chambers G G. The centers of the said masts are formed of metal tubes *n*, supported at bottom on swivel plates O, mounted on friction wheels or rollers, permitting a free rotary motion to the said tubes. Within the outer shell of the mast, around the central tube *n*, but not in contact with the latter, is a casing of india-rubber. The intention of this arrangement is to preserve the masts from liability to fatal injury from shot. A missile penetrating the outer casing, unless it strike the precise center of the inner sustaining-tube, (which will rarely occur,) will cause a partial rotation of the said tube upon its axis, by which the shot will be deflected and glanced off with comparatively little mischief. The steering-gear likewise passes down through one of the protecting-chambers G.

The bulwarks Q extend to a sufficient height above the upper deck to protect the crew and guns thereon, and are made of sufficient strength and inclined at such an angle as to prevent the penetration of shot.

P P represent companion ways, through which the crew ascend and descend to and from the chambers G.

R R represent pikes projecting from the outside of the bulwarks and mounted on hinged rods, so that they may be raised and lowered simultaneously or fixed at any angle to prevent the ingress of boarders.

S S are wings mounted upon pivoted shafts and worked by chains and gearing, or by any other suitable means, so as to set the said wings out at any necessary angles to sheer off a ram or other offensive vessel or to grapple or impede the maneuvers of an enemy. Horizontal guard-bars U may extend from the said wings alongside the ship nearly from stem to stern.

To prevent injury from hot shot lodging in the timber of the ship's sides; the space between the inner and outer planking is formed into water-tight compartments T, each communicating through a tube, *t*, with the upper deck. At the upper end of these tubes are valves W, through which water may be pumped in to extinguish fire in any chamber where its presence may be indicated by smoke rising through the said valves.

W′ W′ represent valves, through which water may descend into the bilge.

V is the pilot-house, pierced with suitable lookout-spaces.

Suitable lookout-spaces are also provided in the upper bulwarks for the use of the captain or helmsman, but contracted in area, so as to prevent the entrance of shot.

It is the intention to fight this ship at close quarters, delivering plunging shots into the enemy.

From the above description it will be seen that a projectile penetrating the sides of the ship at any point will be deflected and conducted through the funnel-shaped spaces K K, so as to avoid any injury to the vital parts of the ship or to her crew, machinery, or guns, all these being either below the water-line or within the protecting-chambers, or else protected by the upper bulwarks D.

I am aware that it has before been proposed to use funnel-shaped openings to conduct shot into and through hollow beams. This, therefore, I do not claim.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. Constructing a ship with funnel-shaped spaces K K, passing transversely through her vital parts, substantially as and for the purposes specified.

2. The transverse chambers G G G, provided with oblique metallic armor for the protection of men, guns, or machinery, substantially as set forth.

3. The use of masses L L of cork or other buoyant material in converging spaces be-

tween mail-clad chambers, substantially as and for the objects specified.

4. The combination, with the hollow masts N N, of the central revolving tubes, *n*, and swivel-plates O, constructed and arranged, as specified, to preserve the masts from destruction by the penetration of shot.

5. The pikes R R, projecting from the bulwarks Q, and mounted upon rods or bars R′, by which they may be elevated or depressed in the manner described.

6. The side arms or wings, S S, constructed and operated as described, to fend off or grapple an enemy.

7. The water-tight compartments T between the inner and outer shell, each provided with one or more ascending tubes, to permit the extinction of fire, substantially as described.

JÜRGEN L. JÜRGENS.

Witnesses:

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T. SHEITLIN.