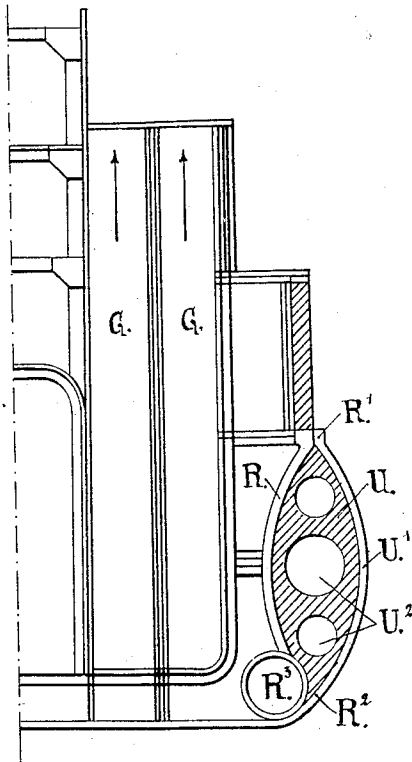


1,008,801.

Patented Nov. 14, 1911.



Witnesses:—
Minerva Sobel
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UNITED STATES PATENT OFFICE.

GIOVANNI EMANUELE ELIA, OF PARIS, FRANCE.

SHIP OR VESSEL.

1,008,801.

Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed February 15, 1909. Serial No. 478,027.

To all whom it may concern:

Be it known that I, GIOVANNI EMANUELE ELIA, a subject of the King of Italy, residing at Hotel Astoria, Avenue des Champs Elysees, Paris, in the Republic of France, have invented certain new and useful Improvements in Ships or Vessels, of which the following is a specification.

This invention relates to ships and vessels and is particularly applicable for use in connection with vessels employed in naval warfare, and has for its chief object to provide increased protection to those parts of the vessel which are liable to torpedo attack or to contact with submarine mines.

The invention consists mainly in neutralizing the destructive force resulting from the sudden generation of a large volume of hot gases on explosion of the torpedo or mine, by supporting a mass of material around the portions of the vessel that are liable to torpedo attack, or to contact with submarine mines and in so arranging the material that it represents a density approximating to that of sea water, so that in the event of a quantity of such material being detached from the vessel by the force of a submarine explosion, the balance of the ship will still be preserved.

The accompanying drawing is a transverse section of part of a battleship provided with a protecting device constructed in accordance with this invention.

In the arrangement shown a mass of concrete U is supported in front of the strong concave plating R by means of steel bars U¹ connected at R¹ to the armored portion of the ship, and at R² to the tubular supporting device R³. Owing to the density of cement being about 2.4, cavities U² are formed in the interior of the mass to reduce the density thereof to that of sea water, namely 1.026. In this way the material in the concave plating R has a weight substantially equal to the sea water displaced.

When the cement is subjected to a submarine explosion, a large quantity of the mass will be broken up and be detached from the ship's hull, the strong concave plate R will however be preserved or be but little damaged. The space previously occupied by the cement together with its cavi-

ties or air chambers will now be occupied by sea water and the balance and displacement of the ship will remain the same. The concave portion R can readily be recharged with cement for again putting the ship into fighting condition. If desired the cavities U² may be dispensed with and the device may be so arranged that the weight lost by the detachment of a certain quantity of cement may be compensated for by the admission of a corresponding weight of sea water into the passages G.

What I claim and desire to secure by Letters Patent of the United States is:—

1. The combination with a ship's hull, of a quantity of material normally retained in position in front of the parts of the ship to be protected but detachable therefrom by the force of a submarine explosion, and having a weight substantially equal to the sea water displaced, whereby the balance of the ship is preserved after the explosion; substantially as described.

2. The combination with a ship's hull, of a mass of concrete normally retained in position in front of the parts of the ship to be protected but detachable therefrom by the force of a submarine explosion, said concrete containing cavities by which the weight of the mass is reduced substantially to that of the sea water displaced, whereby the balance of the ship is preserved after the explosion; substantially as described.

3. The combination with a ship's hull, of strong plating having its outer surface concave below the surface of the water, a mass of concrete arranged to fill such concave portion and means for retaining such concrete in position therein.

4. The combination with a ship's hull, of strong plating having its outer surface concave below the surface of the water, a mass of concrete arranged to fill such concave portion and to present a convex outer surface to the water and a number of supporting members extending across the outer surface of the concrete and connected at their upper and lower ends to the adjacent parts of the ship.

5. The combination with a ship's hull, of strong plating having its outer surface concave below the surface of the water, a mass

of concrete formed with cavities and arranged to fill such concave portion and to present a convex outer surface to the water, and a number of steel bars extending across
5 the outer surface of the concrete and connected at their upper and lower ends to the adjacent parts of the ship.

In testimony whereof I affix my signature in presence of two witnesses.

GIOVANNI EMANUELE ELIA.

Witnesses:

ALBERT J. RATLEY HADMAN,

T. SELBY WARDLE.

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