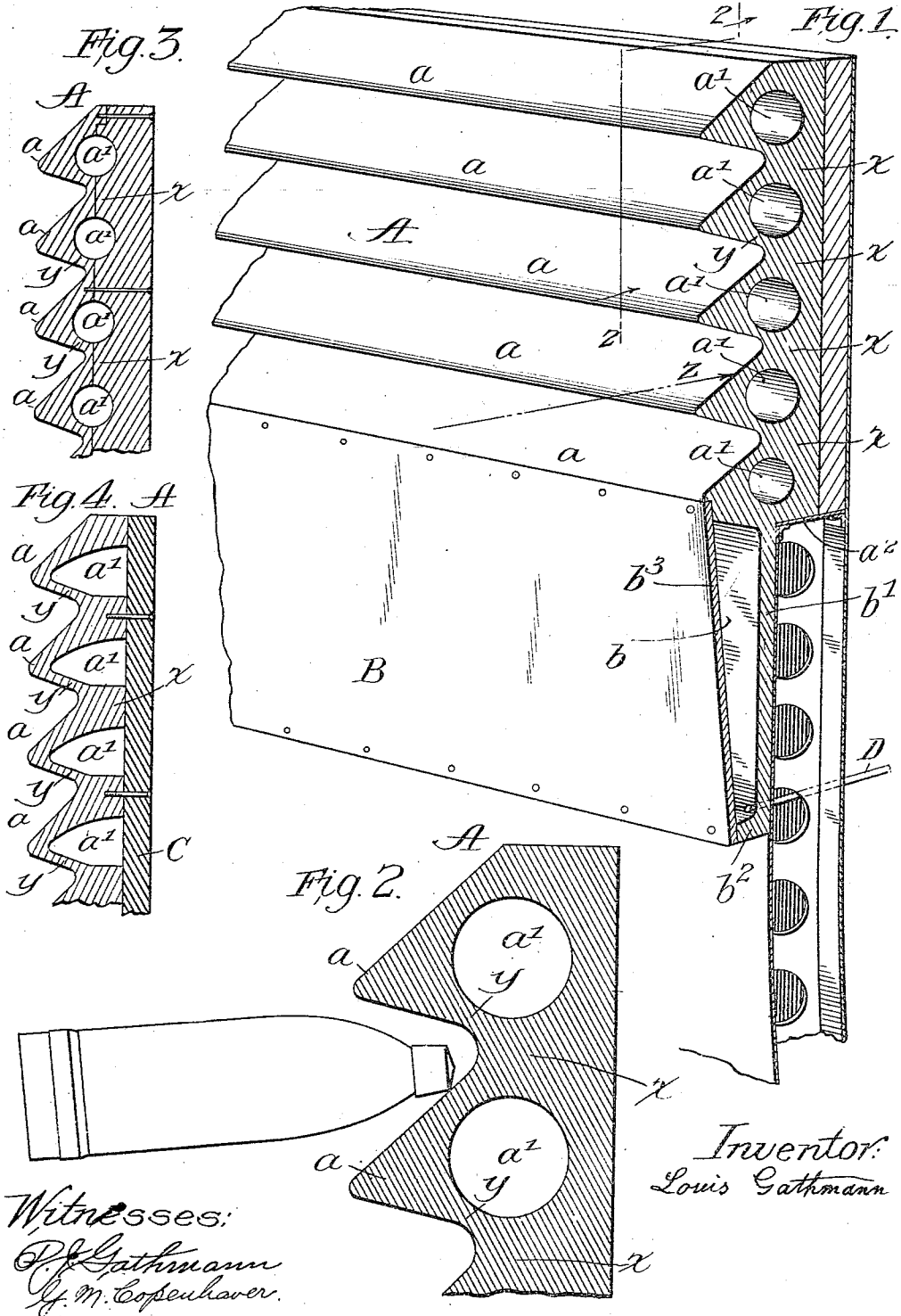


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ARMOR PLATE.
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UNITED STATES PATENT OFFICE.

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ARMOR-PLATE.

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To all whom it may concern:

Be it known that I, LOUIS GATHMANN, a citizen of the United States, residing in Washington, District of Columbia, have invented certain new and useful Improvements in Armor-Plates, of which the following is a specification.

My invention relates to armor plate of the class in which provision is made for obtaining the required strength and resistance without an undue increase in weight, and the primary object of my invention is to produce armor plate having these characteristics, and which in addition is so formed that a projectile on striking it will be so deflected as to be fractured or have its penetrating power destroyed or so reduced as to prevent it from piercing the plate.

Another object of my invention is to provide improved means for absorbing the shocks of explosion above and below the water line.

In carrying out my invention I form armor plate on its outer side with horizontally arranged ribs with intervening grooves and preferably so form such ribs and grooves that the upper face of each rib is inclined to a greater extent than the lower face thereof, so that a projectile when entering a groove will strike the face of the rib having the greatest inclination and glance upward therefrom. In rear of each groove I form a horizontally disposed chamber which is so arranged that that part of the wall of the chamber which is located in the lower part of the rib and above the subjacent groove will be thinner than the wall of the upper part of the chamber. In this way each rib is provided with a part having less resistance than other parts, and this part of least resistance is so located that when a projectile strikes the top of a rib it will glance and be directed toward the part of least resistance, the projectile being turned or tilted and its penetrating power being destroyed or reduced, in many cases the projectile being fractured by reason of its side wall coming in contact with the ribbed surface of the plate.

In order to protect the hull of the vessel below the water line from the shocks of explosion of torpedoes, shells, etc. I form the armor plate with a downwardly projecting relatively thin extension having an outwardly extending flange at its lower end to

which is secured the lower end of an outer plate the upper end of which is secured to the lowermost rib of the armor plate. The armor plate is shouldered and rests on the top of the coffer-dam in the hull of the vessel while the extension covers the coffer-dam to a sufficient extent. In this way a hollow shock-absorbing belt is obtained which can be applied at the same time with the armor plate there being no weak joint or part between the armor plate and the belt.

In the accompanying drawings:—Figure 1 is a perspective view of a combined armor plate and shock-absorbing belt, constructed in accordance with my invention. Fig. 2 is a detail view on an enlarged scale and in section on the line 2—2 of Fig. 1. Figs. 3 and 4 are detail views in section of certain modifications.

A indicates the armor plate and B the shock-absorbing belt. The plate A is provided at the front with parallel horizontally arranged ribs *a* separated by intervening grooves *a'* and each rib is formed with a horizontally disposed chamber *a''*, each two chambers being separated by a solid part *a'''* of the plate. It will be observed that the upper face of each rib is inclined to a much greater extent than the lower face thereof and that the wall *y* of each chamber *a''* in the lower part of the adjacent rib is considerably thinner than the wall *y'* in the upper part thereof. In this way I provide a part having less resistance than the other parts and this part is so located that when a projectile strikes the inclined upper face of a rib, as indicated in Fig. 2, it will glance, tilt and strike and shatter the wall *y* and will then further tilt and its side will strike the rib immediately below it and cause the projectile to fracture. In this way the penetrating power of the projectile is destroyed or reduced. The construction is also such that the weight of the plate is very materially reduced without impairing its efficiency.

It will be observed that the upper wall *y'* of each rib is of greater area than the lower wall *y* thereof and yet the upper wall being thicker presents greater resistance than the lower wall. In this way a projectile-receiving surface is afforded of comparatively large area which is strong enough to receive the impact of the projectile and to deflect it to the weaker wall of the adjacent rib.

The chambered and ribbed armor plate A may have a backing A', as shown, although this is not essential. The plate A is formed with a shoulder a^2 which rests
 5 on the top of the coffer-dam E and it is formed integrally with a downwardly extending portion b' which covers the upper portion of the coffer-dam and protects it. At its lower end the extension b' is formed
 10 with a forwardly projecting flange b^2 to which is secured the lower end of a relatively thin plate b^3 , the upper end of which is secured to the lowermost rib a of the armor plate. In this way a chamber b is
 15 formed which may be closed at opposite ends and which constitutes an air chamber. In order to drain off any water that may enter it I provide a draining tube D. In this way I can conveniently apply a shock-absorbing belt to a vessel at the same time
 20 that the armor plate is applied. The combined armor plate and shock-absorbing belt are readily placed on the upper part of the coffer-dam. There is no weak joint or weak
 25 part between the belt and armor plate and the extension b' serves to reinforce the plate and the hull of the vessel.

The armor plate may be made in various ways, either by forming chambers or channels in the ribs, in the manner indicated in
 30 Fig. 1, or the plate may be made in two sections, as shown in Fig. 3, the channels or chambers being arranged partly in both sections. Or, as shown in Fig. 4, recesses may
 35 be formed in the ribs which extend through the back of the plate and the plate thus formed may be secured to a plate C as shown in Fig. 4.

Other modifications of the invention may
 40 be made without departing from the novel features of my invention.

I claim as my invention:

1. Armor plate formed on its front wall with chambered ribs, each of which has a
 45 projectile-receiving wall made thicker and thus of greater resistance than its other wall which is made relatively weak to receive the point of the projectile glancing from the thicker wall of an adjacent rib.

50 2. Armor plate formed on its front face with chambered ribs having walls of less

resistance and of less area on one side than on the other side thereof.

3. Armor plate formed on its front face with chambered ribs each rib having a lower
 55 wall of less resistance and of less area than its upper wall.

4. Armor plate formed on its front face with chambered ribs having their upper
 60 faces inclined to a greater extent than the lower faces, while the lower walls of said ribs, which are of less area than the upper walls, are formed to have less resistance to penetration of a projectile than the upper
 65 walls thereof.

5. An armor plate formed on its front face with chambered ribs, each having a projectile-receiving wall made of greater area
 70 and of greater resistance than the other wall which is made relatively weak to receive the point of the projectile.

6. Armor plate formed on its front face with chambered ribs having their upper
 75 faces inclined to a greater extent than their lower faces, while the lower walls of said ribs are made thinner than the upper walls thereof.

7. Armor plate having a downwardly extending portion formed integrally with it to
 80 form one wall of a shock-absorbing belt and to protect the hull of a vessel below the water line.

8. Armor plate having a downwardly extending portion formed integrally with it to
 85 form the inner wall of a shock-absorbing belt, and a front plate secured to the armor plate and to the downwardly extending portion thereof.

9. Armor plate having a downwardly extending portion formed integrally with it to
 90 form the inner wall of a shock-absorbing belt, and having a forwardly projecting flange at its lower end and an outer plate secured at its lower end to said flange and at its upper end to said armor plate there
 95 being a chamber between the inner and outer plates for the purpose specified.

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