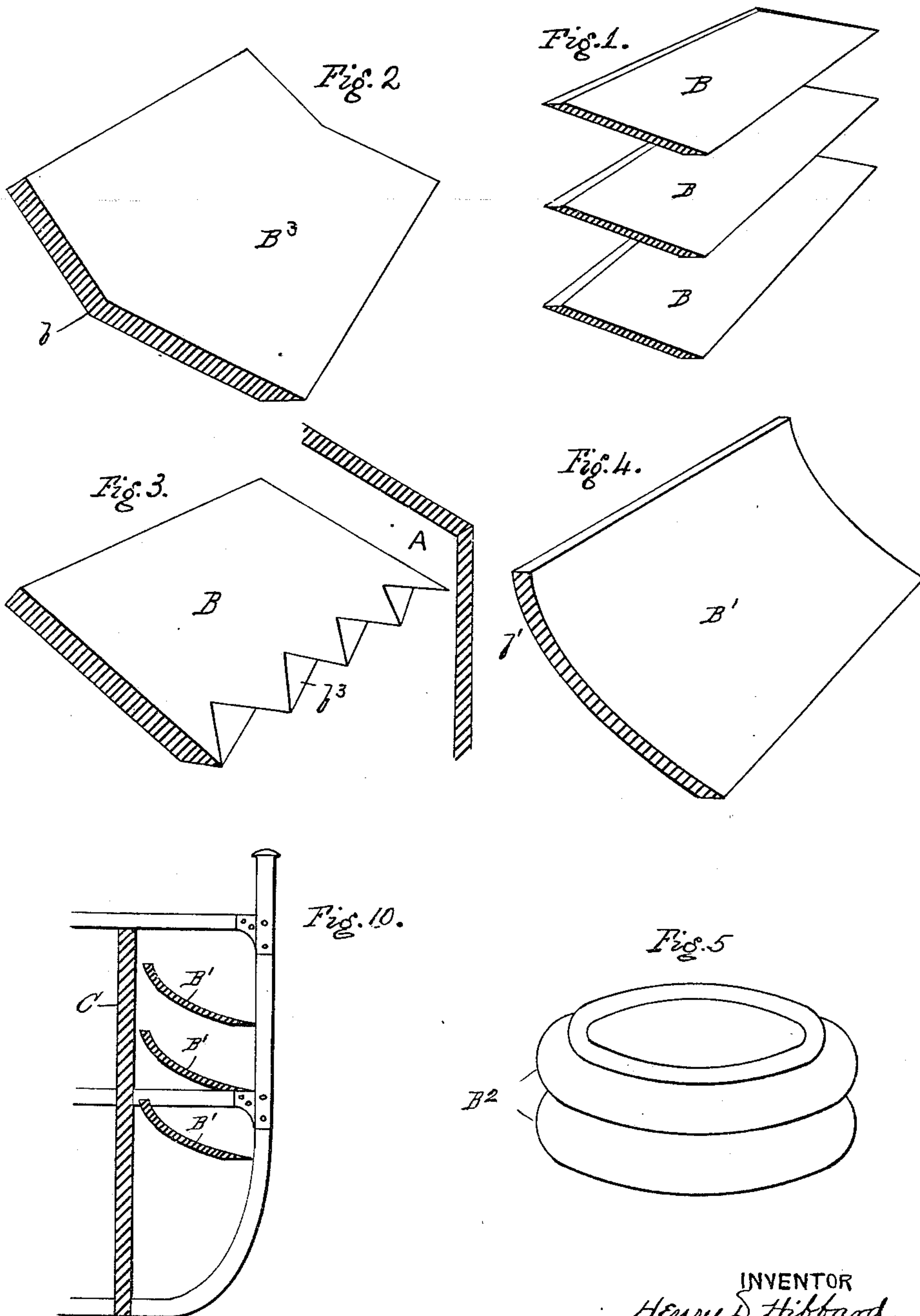


No. 860,378.

PATENTED JULY 16, 1907.

H. D. HIBBARD.
ARMORED DEFENSE.
APPLICATION FILED OCT. 8, 1903,

2 SHEETS—SHEET 1.



WITNESSES
Matter above
Paul A. Blair.

INVENTOR
Henry D. Hibbard
BY
Horton and Horton
ATTORNEYS

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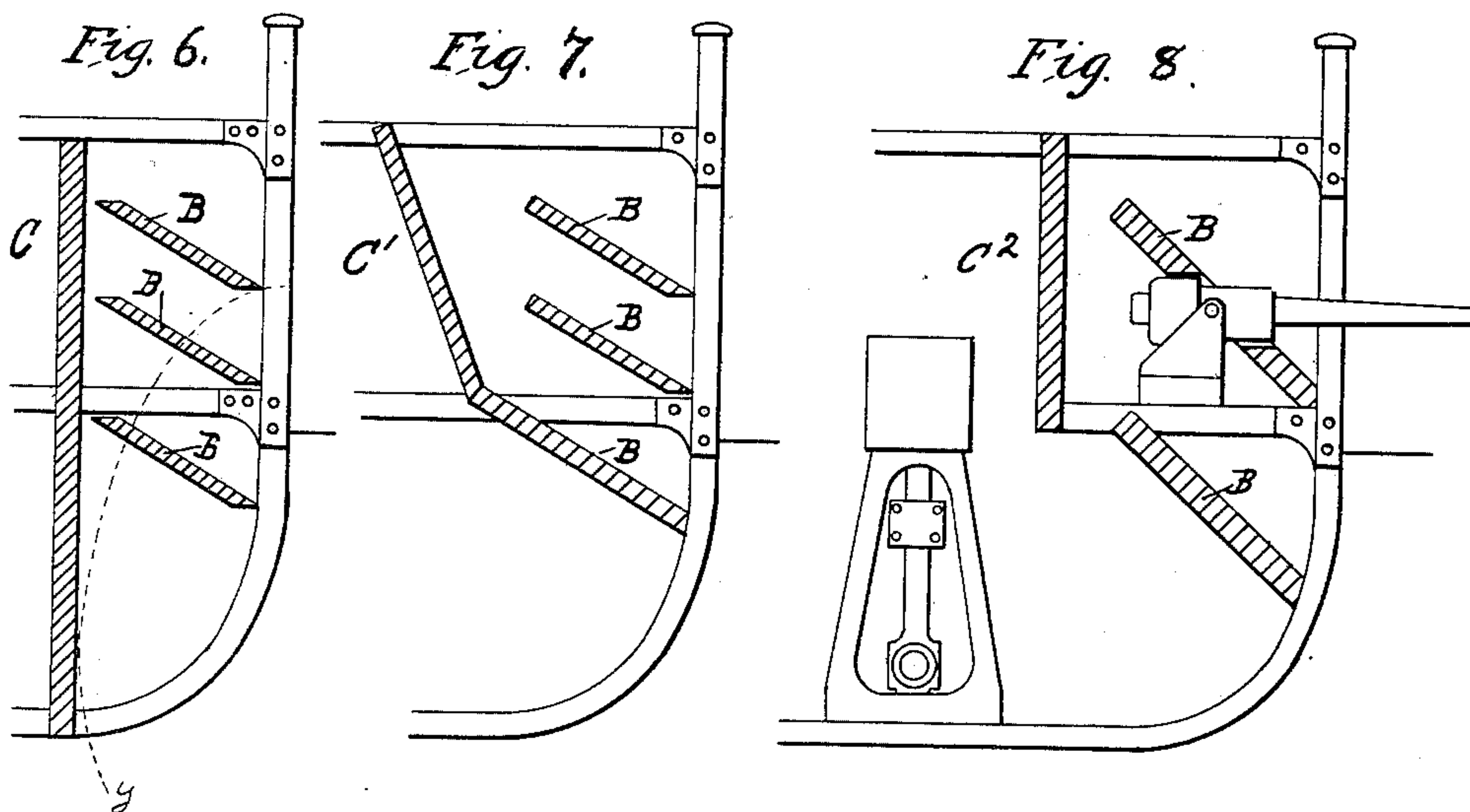
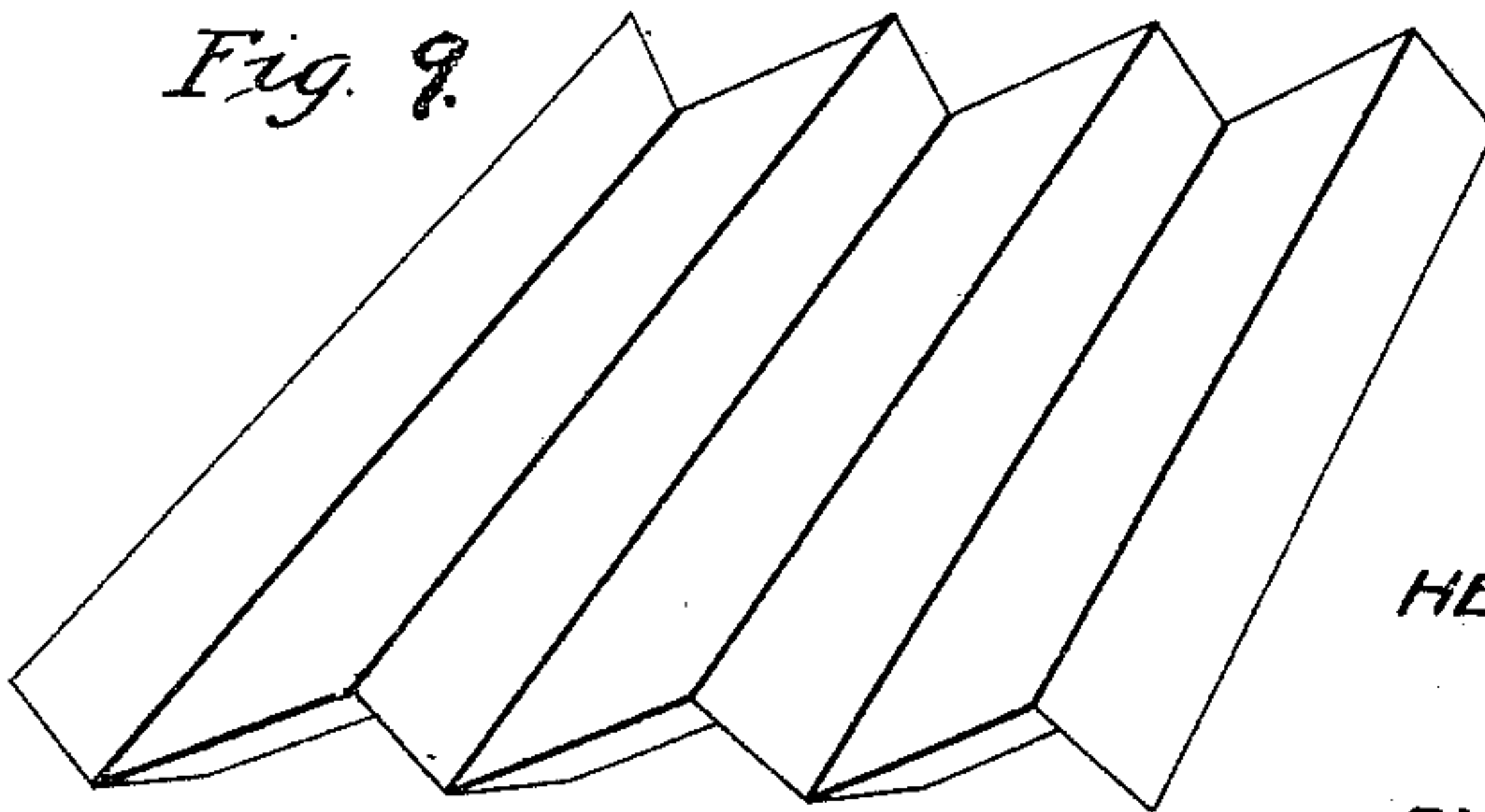


Fig. 9.



WITNESSES
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UNITED STATES PATENT OFFICE.

HENRY D. HIBBARD, OF PLAINFIELD, NEW JERSEY.

ARMORED DEFENSE.

No. 860,378.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed October 8, 1903. Serial No. 176,303.

To all whom it may concern:

Be it known that I, HENRY D. HIBBARD, a citizen of the United States of America, residing in Plainfield, in the county of Union, State of New Jersey, have invented an Improved Armored Defense, of which the following is a specification.

The object of my invention is to provide for ships and fortified places an armored defense against projectiles, which will be more efficient than the ordinary armor plate with the same thickness of metal or equally efficient with a less thickness of metal.

The principal feature of my invention consists in providing a shot-deflecting surface at the rear more nearly perpendicular to the line of fire, and against which the projectile after deflection can be smashed, if not already smashed, or by which it can be further deflected. For this purpose it is important that there should be no armor or like substantial obstruction to the passage of the shot from the first deflecting plate to the second plate, and accordingly this space may be spoken of as a clear space, but I do not wish that expression to exclude the possible utilization of such space for storage of goods, which would have no material effect in stopping the flight of a projectile.

My invention may be carried out in many different ways. In the accompanying drawings I have illustrated some of the ways in which my invention may be carried out or applied. Others can be readily devised to embody the main features of the invention.

Figure 1 is a perspective view of an overlapping set of deflecting plates; Fig. 2 is a perspective view of a deflecting plate bent to have two planes of deflections; Fig. 3 is a perspective view of a deflector plate having a corrugated edge; Fig. 4 is a view of a plate bent to a curve but otherwise similar to the plate of Fig. 2; Fig. 5 is a perspective view of annular inclined plates designed for the protection of a turret or gun mount; Fig. 6 is a sectional view showing a multiple series of plates in combination with an armor plate in their rear for further deflecting or smashing the projectile; Fig. 7 is a view similar to Fig. 6, but of a modification; Fig. 8 is a sectional view of a vessel with a gun projecting through a deflector; and Fig. 9 is a view of a modified form of deflector plate. Fig. 10 is a view of a structure provided with the plates of Fig. 4.

In this specification "line of fire" means a line substantially perpendicular to the principal horizontal element of the line of defense; "front" means in the direction of the enemy, while "rear" means the opposite side which is to be protected.

My invention is carried into effect by the employment of a plurality of deflecting surfaces inclined to the line so that a shot deflected by a first such surface will be deflected again or smashed if it has not already been smashed, or will be stopped by the succeeding deflecting surface or surfaces.

In carrying out my invention I prefer to employ one or more inclined plates. If a number of plates be used, the separate inclined plates may be flat plates B as illustrated in Fig. 1, arranged in horizontal or vertical lines, and preferably one slightly overlapping the other with reference to the line of fire. Or a plate may be used bent upward at the rear, so as to continue the deflection of a shot which may have struck the forward part of the deflecting surface. Thus in Fig. 2, I have shown a plate B³ with an angular bend *b* at the rear, for this purpose. In Fig. 4 I have shown a plate B¹ having its rear similarly bent upwardly at *b*¹, but on a curve. This invention may be readily applied to turrets or other places which require curved armor plates. Thus in Fig. 5 I have illustrated the inclined plates in the form of rings B² for protecting turrets. The inclined deflecting plates may have corrugated faces as illustrated in Fig. 9. With these inclined deflecting plates I combine armor at the rear so arranged as to either stop and break up the projectile (by striking on its side) or further deflect the projectile and allow it to pass off in a direction where it will do no harm.

In Figs. 6, 7, and 8, I have shown the inclined plates B arranged on lines the length of the vessel, and combined with armor plates C, C¹, C², at the rear. In Fig. 6, the rear armor plate is shown as arranged vertically or thereabouts, so that a shot striking the upper face of one of the front inclined plates B will be deflected and thrown upwards to strike the rear plate C. The same result will be accomplished if the shot strikes on the face of the lower line of plates B in the arrangement shown in Fig. 8. If the shot strikes the upper line of plates B (Fig. 8) the shot will be deflected upwards so that it will pass off into the air above and out of the way of doing harm. In Fig. 7, I have shown the rear plate C¹ as set at an angle to further deflect and throw up into the air a shot striking the upper face of any of the three lines of inclined plates B.

In the case of a chance shot striking the front edge of one of the deflecting plates so as to be deflected downwards, this would be harmless in the case of land fortifications, as the earth below would then receive the shot without damage to any thing in the rear. In the case of a vessel, the danger to the engines or boilers from such a shot can be obviated in either of two ways. Thus the rear plate C may be carried down until it reaches the outer skin of the hull, as illustrated in Fig. 6, in which case the flight of a downwardly directed shot will be as indicated by the dotted line *y* in Fig. 6. With such a construction the space between the rear plate C and the outer skin of the vessel's hull could be used for storage of coal or other material. The other and preferable way of obviating danger from a chance shot striking the edge of one of the plates B is to make the front edge of the plate cor-

rugated, as shown at b^3 in Fig. 3, and thereby the shot would be deflected to the left or to the right, so that the angle of impact against the next lower plate would be less than that at which the shot would bite and so penetrate. The shot would then be deflected and fail to reach a vital part of the ship. In this Fig. 3 a part of the supporting structure to which the plates are rigidly fastened is indicated at A.

The vertical armor C, C^2 , may be placed so far to the rear on a ship as to leave room between it and the deflectors B for gun positions, while completely protecting the engines and boilers, as illustrated in Fig. 8.

The deflecting plates are best made of tough steel, either face hardened or hard throughout. Manganese steel is a metal well suited for these deflecting plates. As the shot velocity is of course greater before deflections than after, the rear or secondary deflecting plate, as at C^1 in Fig. 7 may be made lighter or thinner than the front deflecting plate B. The vertical armor plates should be of tough steel and may be provided with hardened faces or not, as desired.

I claim as my invention

1. Armored defense, comprising a supporting structure, carrying a rigidly fastened shot-deflecting surface in combination with another shot-deflecting surface at its rear more nearly perpendicular to the line of fire, to deflect a shot a plurality of times in its flight, with a clear space for the passage of the shot from the first to the second surface.

2. Armored defense, comprising a supporting structure, carrying a rigidly fastened shot-deflecting plate in combination with another shot-deflecting plate at its rear more nearly perpendicular to the line of fire, to deflect a shot a plurality of times in its flight, with a clear space for the passage of the shot from the first to the second surface.

3. Armored defense, comprising a supporting structure provided with a plurality of rigidly fastened deflecting plates overlapping each other with reference to the line of

fire, with clear spaces between said plates through which a deflected shot may pass.

4. Armored defense, comprising a supporting structure, provided with a plurality of rigidly fastened deflecting plates, with clear space between the plates through which a deflected shot may pass, in combination with armor plate at the rear more nearly perpendicular to the line of fire.

5. Armored defense, comprising a supporting structure, provided with a plurality of rigidly fastened and overlapping deflecting plates, between which a deflected shot may pass, one or more of said plates having their rear edges bent.

6. Armored defense, comprising a supporting structure, provided with a plurality of rigidly fastened deflecting plates with clear space between the plates through which a deflected shot may pass, in combination with armor plate at rear having its front face approximately vertical.

7. Armored defense, comprising a supporting structure, provided with inclined shot-deflecting plate rigidly fastened, in combination with an armor plate at the rear of said deflecting plate more nearly perpendicular to the line of fire, to smash the deflected projectile, with a clear space for the passage of the shot from the first to the second surface.

8. Armored defense, comprising a supporting structure, provided with a rigidly fastened shot-deflecting plate, adapted to deflect a shot upward, in combination with an armor plate at the rear of said deflecting plate, more nearly perpendicular to the line of fire, with a clear space for the passage of the shot from the first to the second surface.

9. Armored defense, comprising a supporting structure, provided with a plurality of rigidly fastened deflecting surfaces inclined to the line of fire, to deflect the shot in an upward direction, with a clear space for the passage of the shot from the first to the second surface.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

HENRY D. HIBBARD.

Witnesses:

HUBERT HOWSON,
F. WARREN WRIGHT.