H. Caudwell. Sheet 1, 2, Sheets.

Armor Clad.

No. 41,278. Patented Jan. 19, 1864.

Fig: 1.

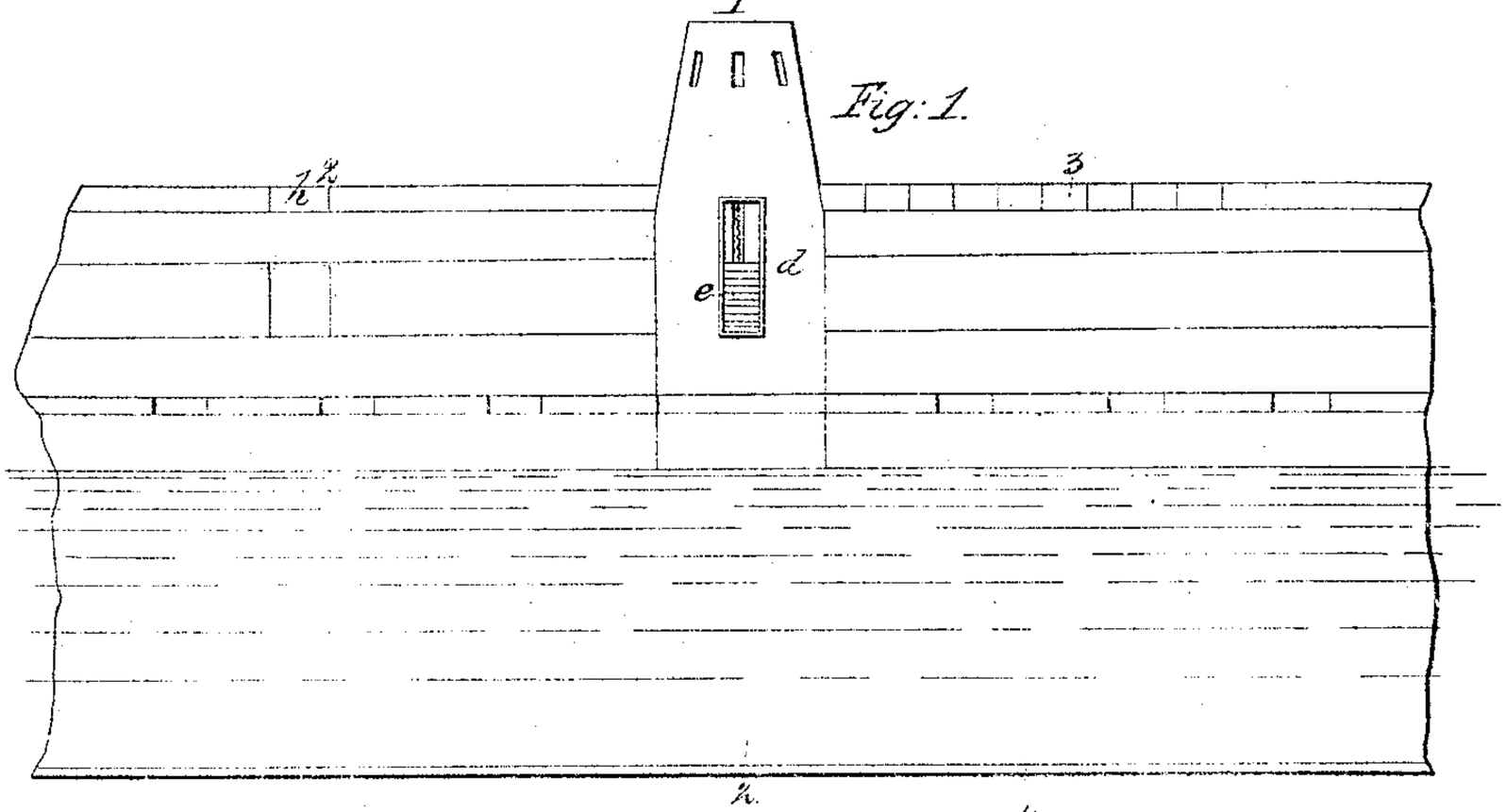


Fig: 5.

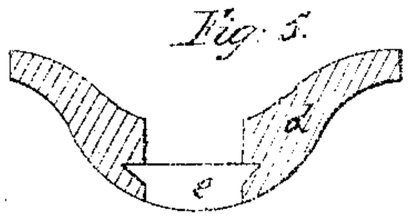


Fig: 2.

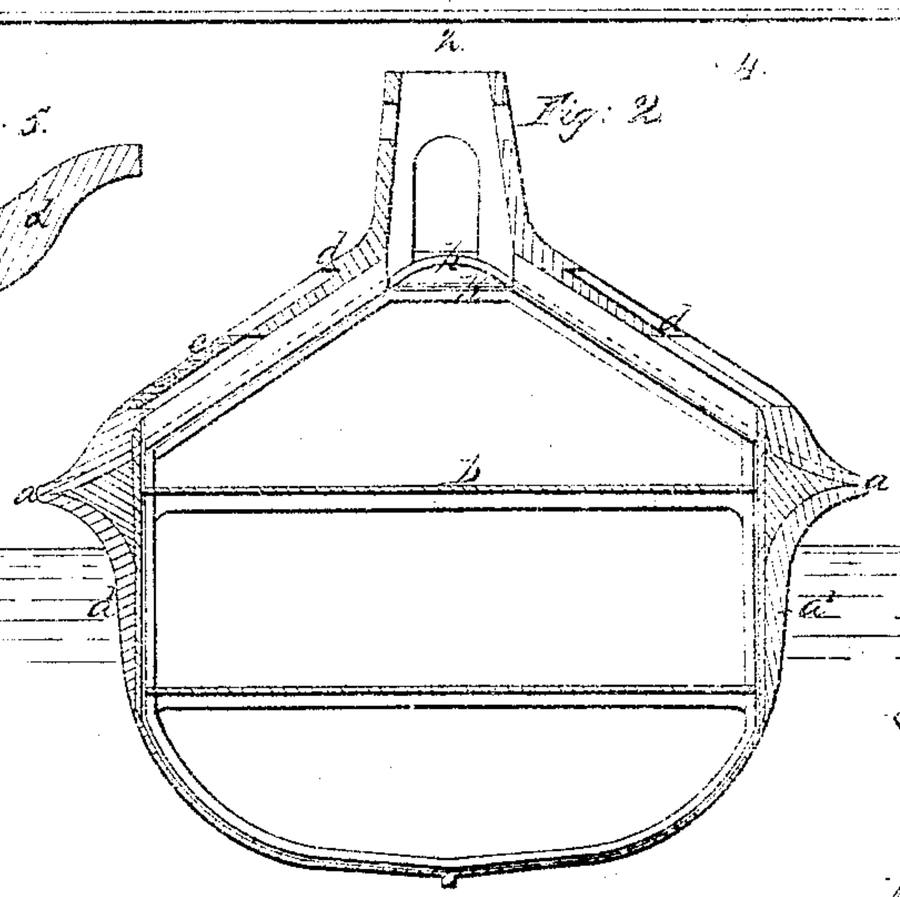


Fig: 7.

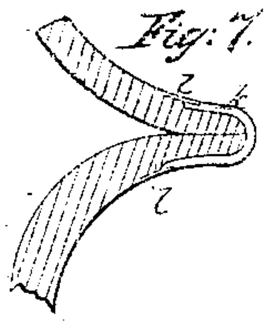


Fig: 4.

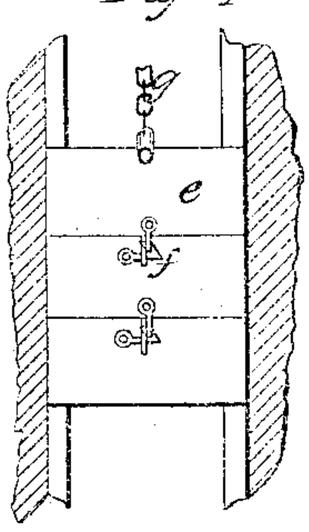


Fig: 3.

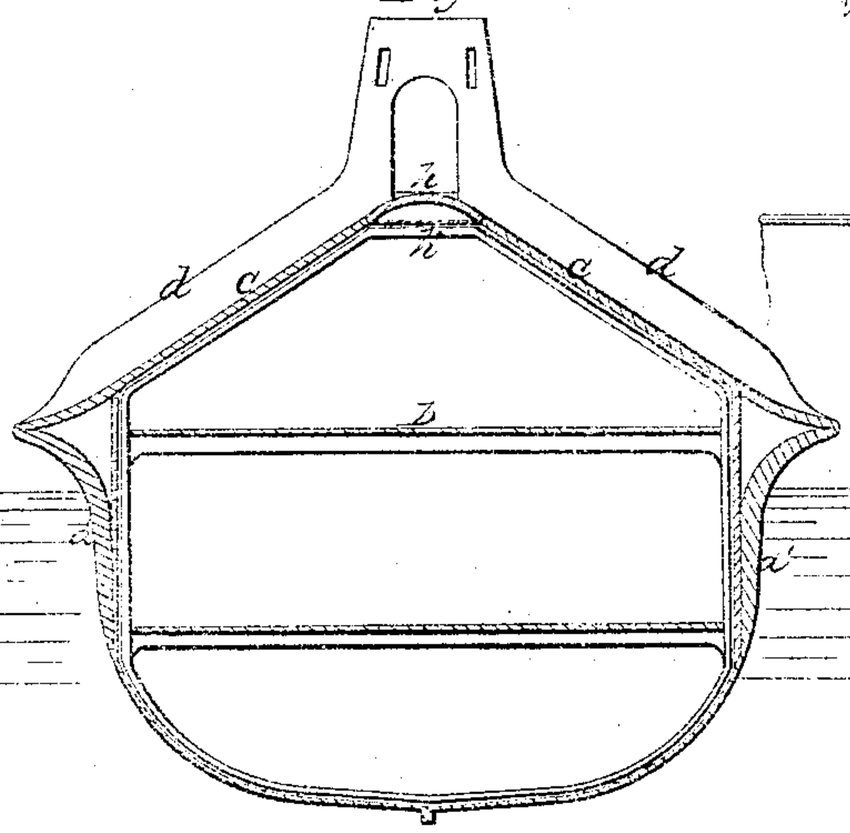
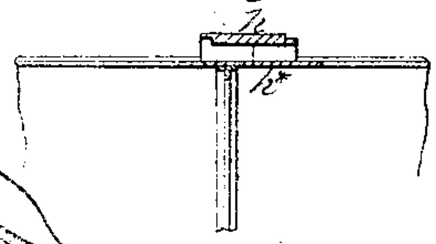


Fig: 6.



Witnesses:

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H. Caudwell Sheet2, 2 Sheets.

Armor Clad.

No. 41,278. Patented Jan. 19, 1804.

Fig: 8.

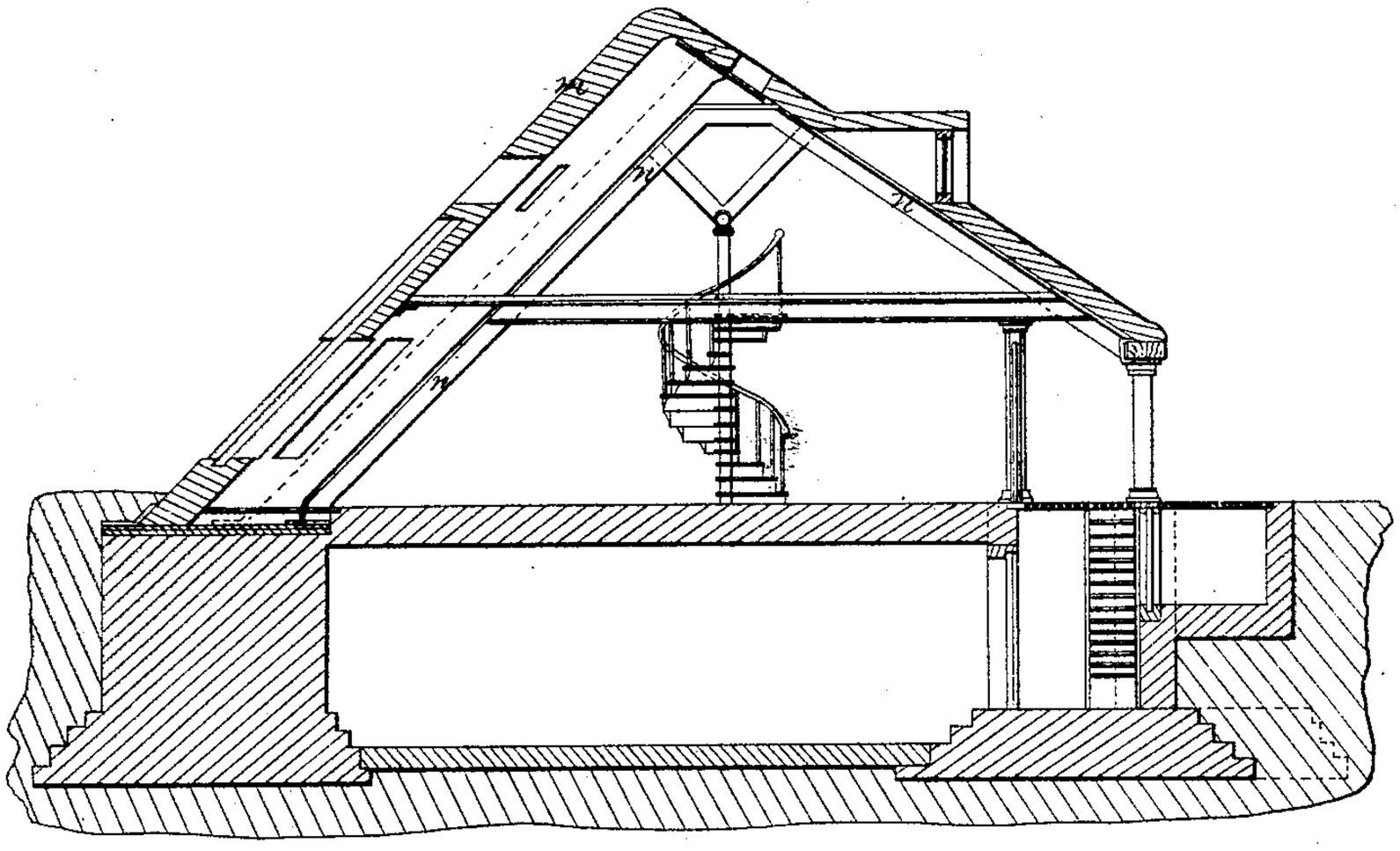
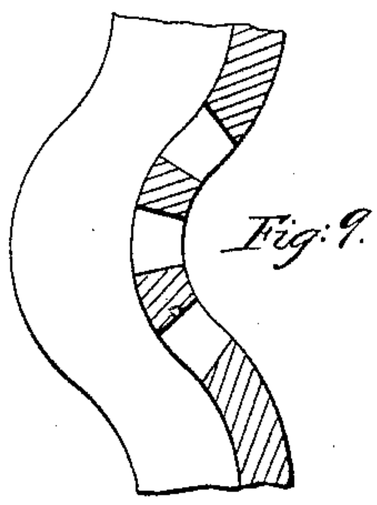


Fig: 9.



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UNITED STATES PATENT OFFICE.

HENRY CAUDWELL, OF OATLANDS HOUSE, SHILLINGFORD, ENGLAND.

IMPROVED CONSTRUCTION OF SHIPS OF WAR.

Specification forming part of Letters Patent No. 41,278, dated January 19, 1864.

To all whom it may concern:

Be it known that I, HENRY CAUDWELL, of Oatlands House, Shillingford, in the county of Oxford, England, gentleman, have invented Improvements in the Construction of Vessels of War, part of which improvements is applicable to fortifications; and I do hereby declare that the following is a full and exact description of the said invention.

The chief object of this invention is so to construct ships of war that they shall possess ample facilities for the working of broadside-guns, while at the same time effectual protection is afforded to the crew and also to the hull of the ship, access to the upper deck by boarders being provided against.

In the accompanying drawings, Figure 1, Sheet I, shows in partial side elevation a vessel constructed according to my invention. Fig. 2 is a transverse section of the same, taken in the line 1 2 of Fig. 1, and Fig. 3 is a transverse section taken in the line 3 4.

The hull of the vessel, it will be seen, is constructed with a curved projecting lip of wrought-iron, *a a*, running around it just above the water-line. This projecting lip is formed of slabs of wrought-iron sufficiently strong to resist solid shot, and of such sectional shape as to deflect them either upward or downward, according to the level at which they strike. Below the slabs forming this lip I continue the armor-plating, as shown at *a' a'*, any desired number of feet below the water-line, tapering off the same until its attribute of armor-plating is lost in uniting with the skin of the vessel, as shown at Figs. 2 and 3. The projecting lip *a* will serve in case of a collision as a protection, and it may with advantage be partially overlaid, as hereinafter described, with an elastic covering of any suitable material.

The deck *b b* of the vessel I protect with a sloping or pitched roof, *c c*, formed of plates of wrought-iron. Along the sides of the roof, at suitable distances apart—that is, at distances corresponding to the positions where it is desired to mount broadside-guns—I form broad corrugations, or rounded hollow projecting ribs *d d*, which run upward from the hull and form internal recesses. These corrugations I pierce, as shown best at Fig. 1, to form port-holes for the guns, which are planted behind the recesses, ready to be moved forward into the recesses, when sliding metal shutters *e e* are raised to allow of the muzzles of the guns being projected through the port-holes. These shutters I make shot-proof and construct them as shown in the detached views, Figs. 4 and 5, Fig. 4 representing a portion of a port-hole, as seen in sectional plan, fitted with the metal shutters *e*, and Fig. 5 showing the same in cross-section. These shutters consist simply of plates of iron or steel let into parallel rabbeted grooves formed in the edges of the pierced armor-plates and connected together by latches *f* on their inner face. Attached to the uppermost plate is a chain, *g*, which passes upward along the deck-roof to a roller within the roof and is thence brought down to a capstan on the deck. When, therefore, it is intended to fire the gun at an elevation, the lower plates of the shutter are detached from the upper plates and only the upper plates are elevated; but when the gun is required to be depressed all the plates must be raised to allow of that depression. In no case, however, need the shutter be raised higher than is sufficient to permit of the gun being run out. Between the corrugated ribs I propose, also, to construct apertures for the purpose of throwing out shells from mortars, as shown at Fig. 1.

The upper portion or ridge of the roof of the deck I construct of ridge-shaped plates *h h*, which interlock with each other, and those near the midships I cause to slide in grooves running longitudinally of the ship, as shown in the detached sectional view, Fig. 6. These ridge-plates *h* are made to slide, in order to open up access (by the withdrawal of one or more of the plates) to the interior of the vessel for the purpose of receiving the armament and provisions. Below these plates I fit removable iron gratings *h* h**, which, like the plates, may also be slid forward or backward to complete the uncovering of the space required for ingress and egress. The chief use of these gratings is to form a guard against boarders, and yet allow of ventilation when the ship is in action, some of the ridge-plates being, for the purpose of ventilation, slid out of position, and others, which are hinged, as shown at h^2, Fig. 1, being open for the like purpose. The corrugated ribs I prefer shall terminate in a shot-proof cone, as shown at Fig. 2, provided with an iron door for the ingress and egress of the crew. The interrup-

tions which these cones make to the line of roof-ridge afford a space for receiving the ridge-plates, and also the gratings when slid backward or forward, as explained, and from these cones sights may be taken and the look-out kept up. These hollow cones may also be used for ventilating the ship, and they may be pierced and then used as rifle-towers.

Fig. 7 shows the manner of applying an elastic material—such as india-rubber compound—to the circumscribing-lip of the vessel. The lip is recessed in parts to receive lengths of this elastic material, which is shown at *k*, and when molded into its place it is held there by overlapping plates of metal *l l*, which are themselves secured to the lip-plates by screws or rivets. This cushion of elastic material is not made continuous, but is protected by being inserted in recesses to prevent, in the event of a collision, a long length of it being stripped off.

The invention also applies to the protection of forts or land defenses, the corrugated roofing being in this case applied to the covering of the exposed faces of the land defenses. This part of my invention is shown in the sectional elevation Fig. 8, in Sheet II, which figure represents a land fortification fitted with a shot-proof roof somewhat similar to that described for protecting the decks of ships. The iron plates *m m*, forming the inclined roof, are secured to beams *n n*, which are braced together to constitute a strong structure. The curved plates forming the recesses for the guns are pierced with three long slots, as shown in the partial sectional plan, Fig. 9, to give the guns the widest possible range. Shutters similar to those above described will also be applied to cover the openings for the guns. The internal arrangement of the forts may be such as is shown, or may be carried out in any other approved manner.

If thought desirable, the corrugations may be made vertical instead of inclined, as shown.

Having now set forth the nature of my invention, I claim—

1. The corrugated armor-plated roof having the port-holes in the corrugations *d d*, substantially as herein specified.

2. The port-shutters composed of a number of separate plates of iron or steel, *e e*, arranged one above another and fitted to grooves in the edges of the armor-plates, to operate substantially as herein specified.

3. The employment of india-rubber or other elastic material in combination with the circumscribing-lip of the vessel, substantially as herein specified.

In witness whereof I, the said HENRY CAUDWELL, have hereunto set my hand this 21st day of October, in the year of our Lord 1863.

HY. CAUDWELL.

Witnesses:

M. WYNN,

WALTER C. KING,

Both of 24 *Royal Exchange.*