(No Model.)

4 Sheets—Sheet 1.

G. H. JONES.

TORPEDO GUARD.

No. 559,490. Patented May 5, 1896.

Fig. 1.

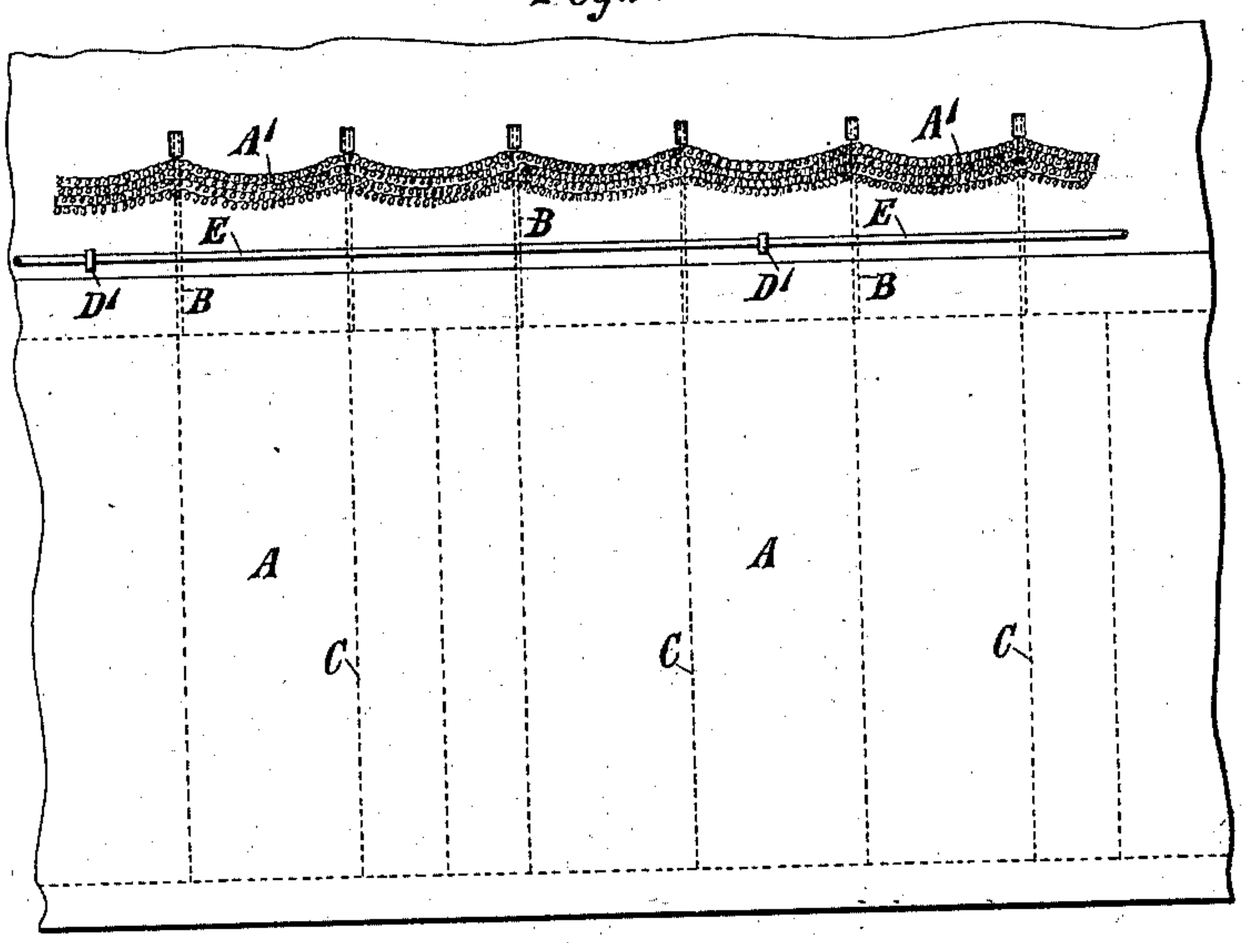
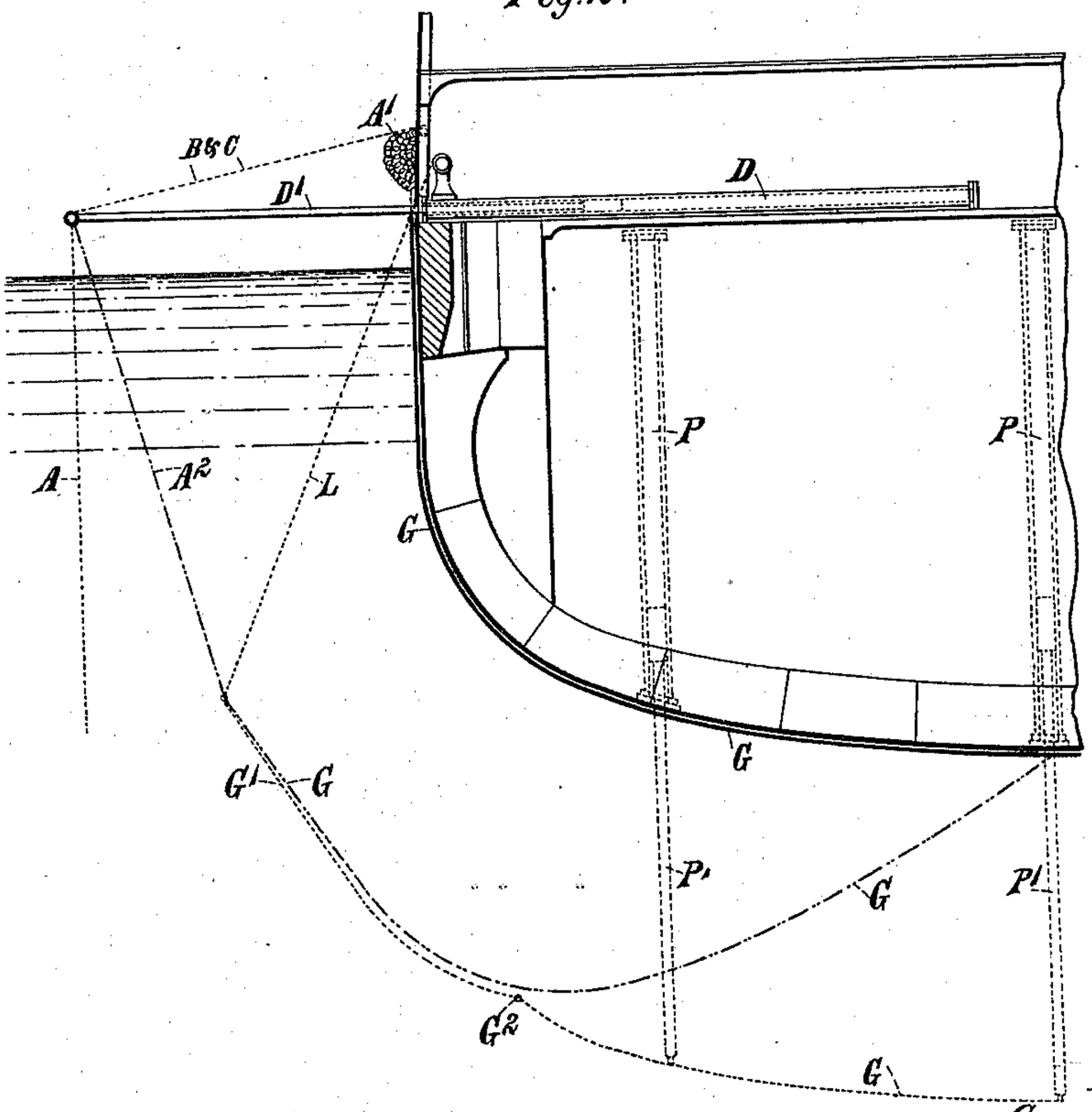


Fig. 2.



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(No Model.) 4 Sheets—Sheet 2.

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TORPEDO GUARD.

No. 559,490. Patented May 5, 1896.

Fig. 3.

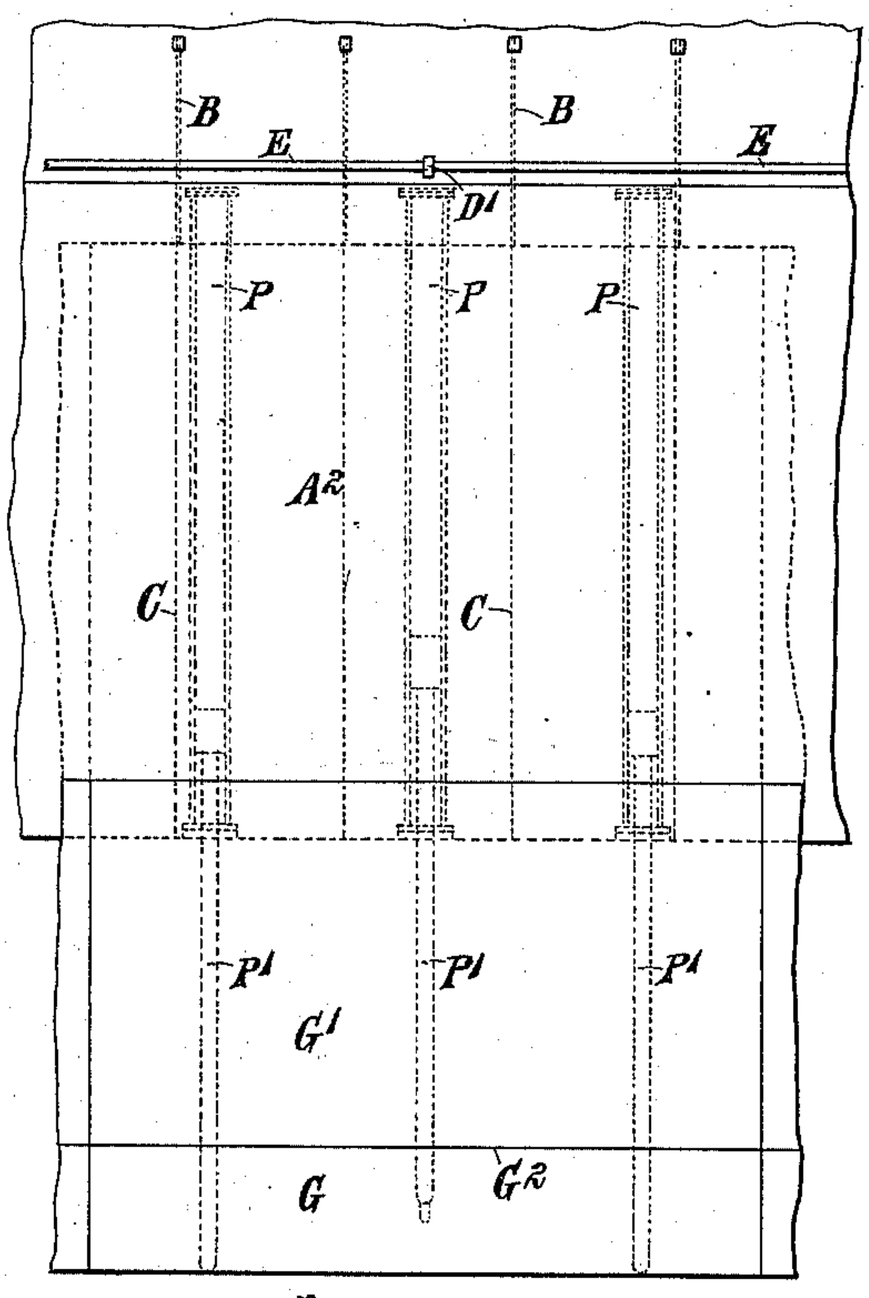

Fig. 4.

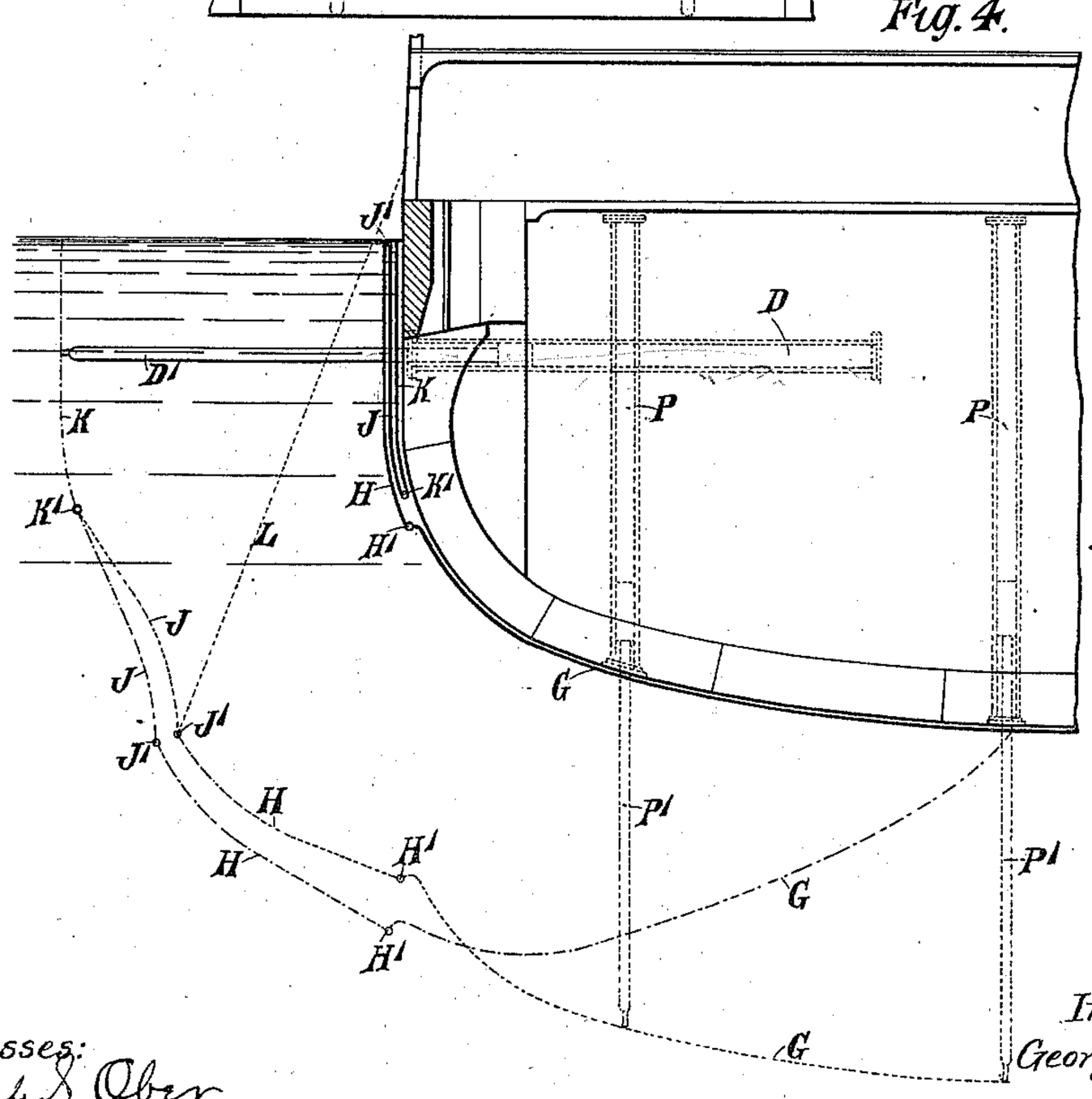

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Fig. 5.

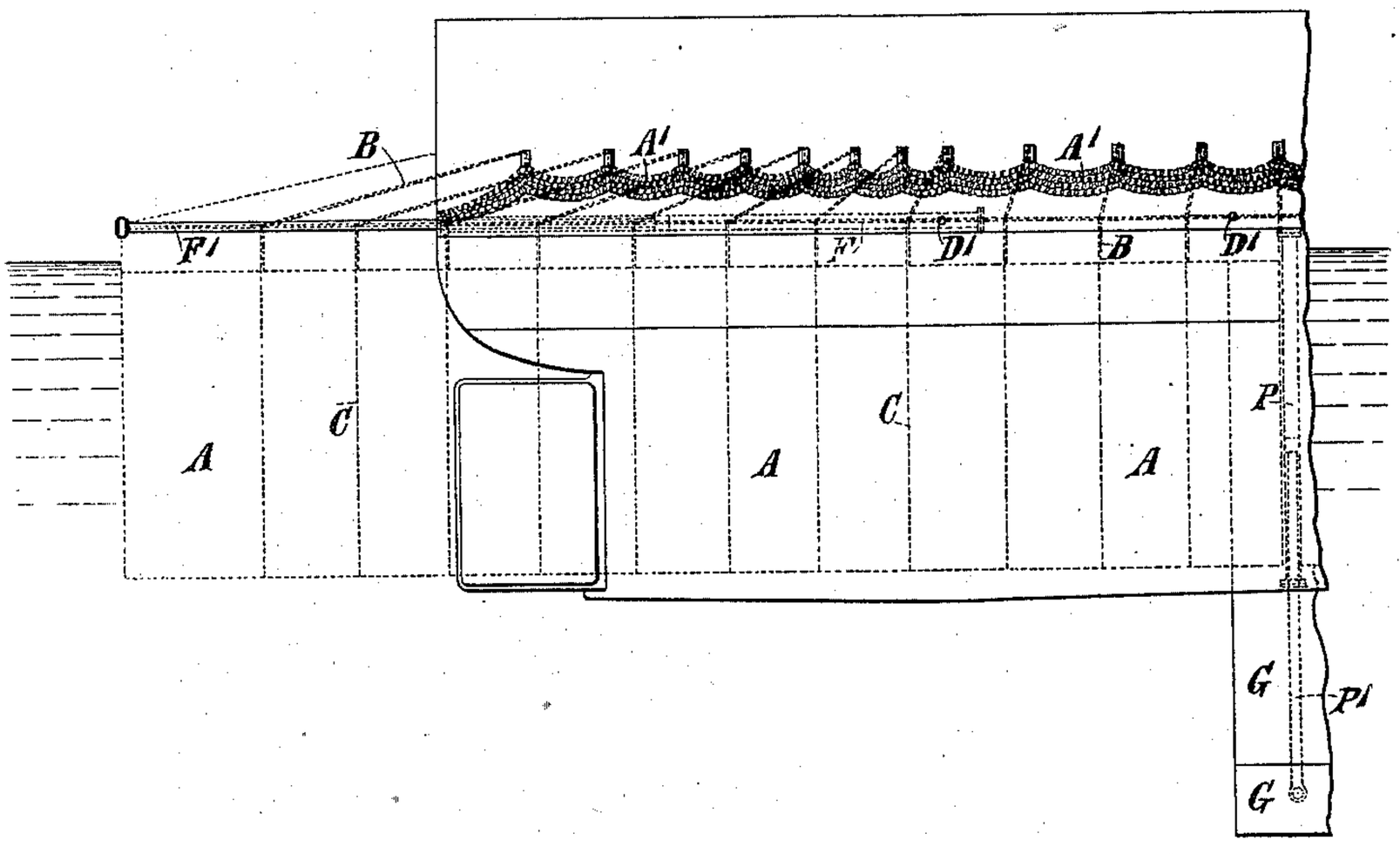
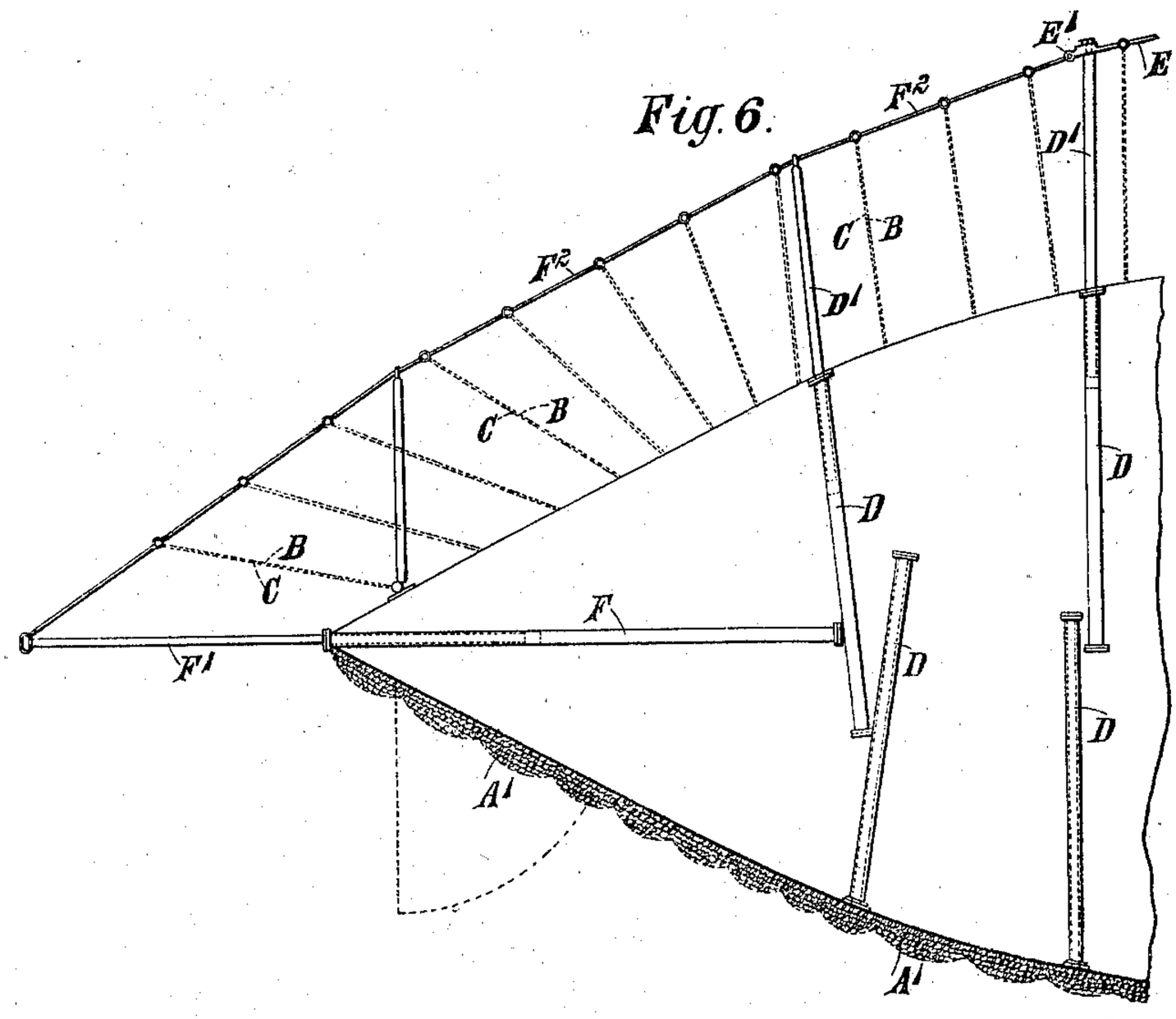


Fig. 6.



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(No Model.) 4 Sheets—Sheet 4.

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Fig. 7.

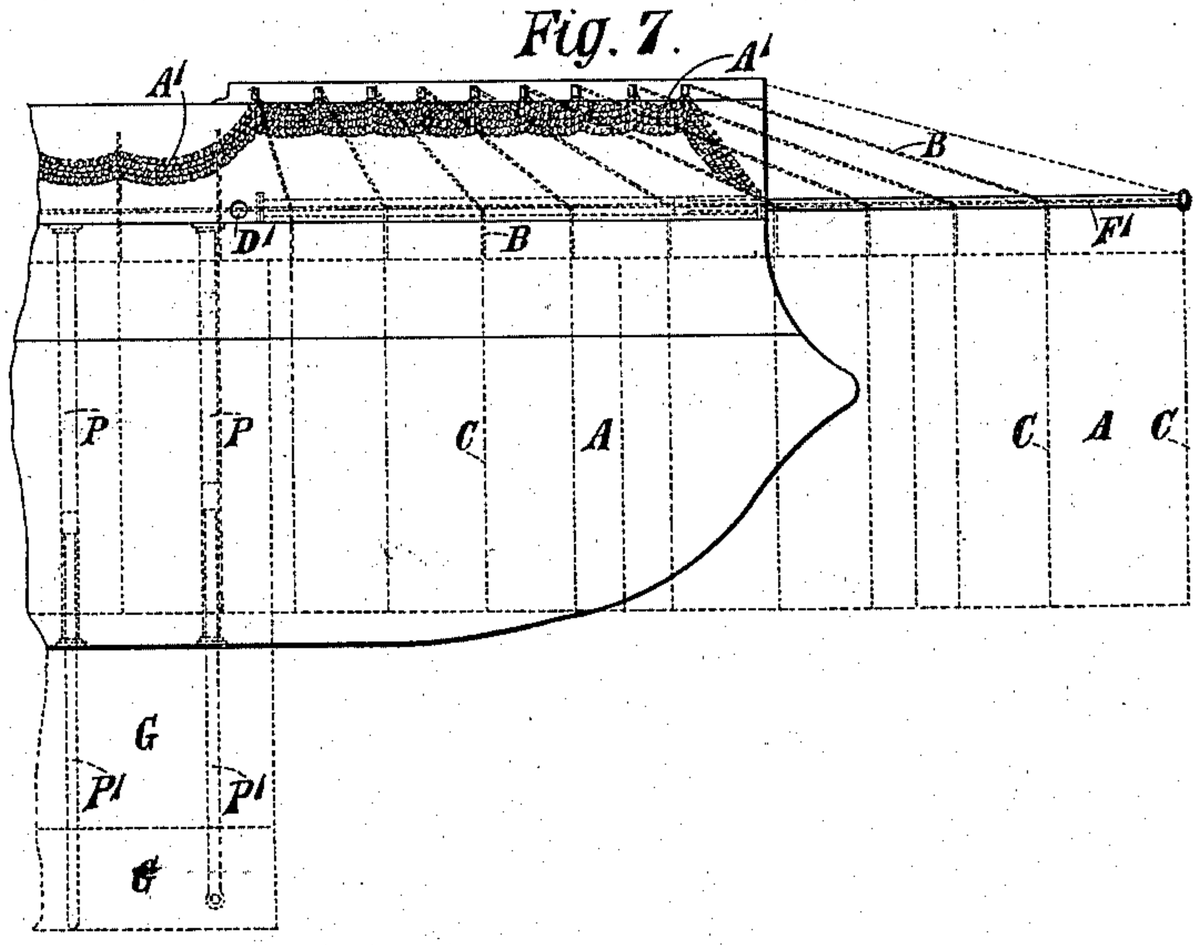


Fig. 8.

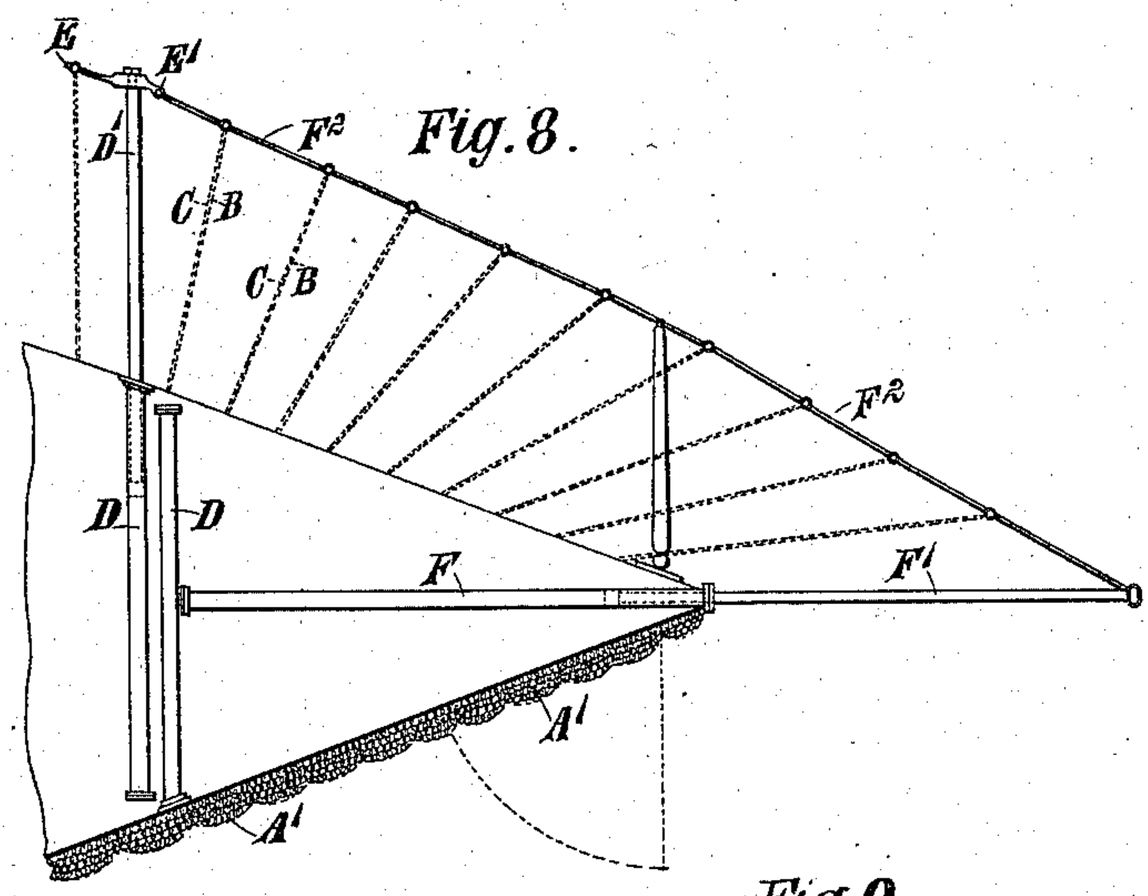
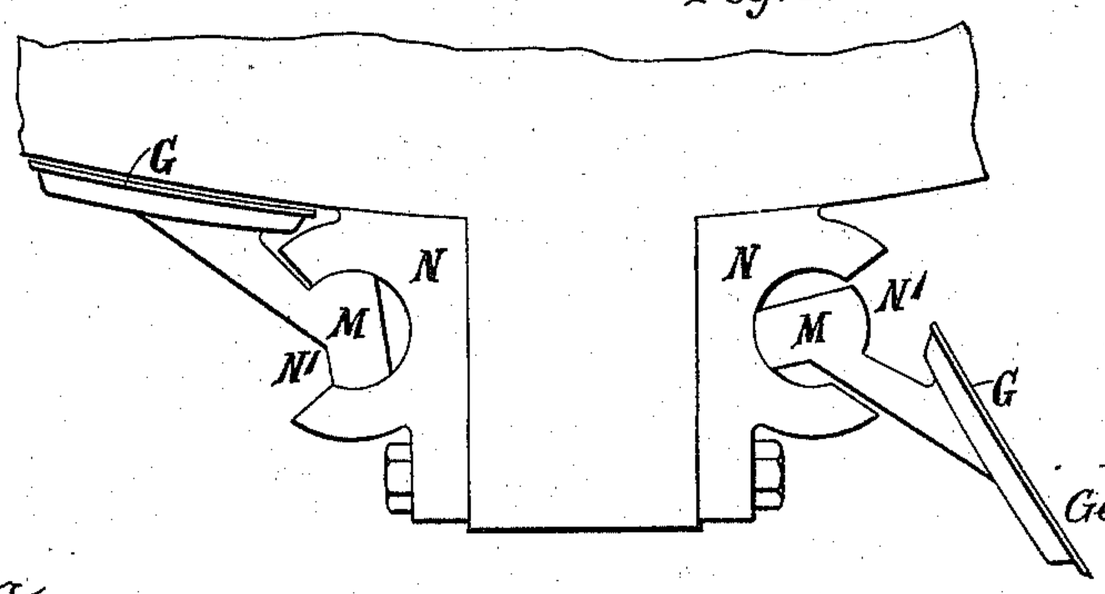


Fig. 9.



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UNITED STATES PATENT OFFICE.

GEORGE HORATIO JONES, OF LONDON, ENGLAND.

TORPEDO-GUARD.

SPECIFICATION forming part of Letters Patent No. 559,490, dated May 5, 1896.

Application filed October 12, 1893. Serial No. 487,957. (No model.) Patented in England November 1, 1892, No. 19,672; in Italy May 17, 1893, LXVI, 390, XXVII, 34,003; in Germany July 3, 1893, No. 69,382, and in France August 3, 1893, No. 229,736.

To all whom it may concern:

Be it known that I, GEORGE HORATIO JONES, surgeon-dentist and doctor of dental surgery, a subject of the Queen of Great Britain, residing at Bloomsbury, London, in the county of Middlesex, England, have invented certain new and useful Improved Means for Protecting Ships Against the Attack of Torpedoes and Submarine Boats, (for which I have obtained patents in the following countries: Great Britain, No. 19,672, dated November 1, 1892; Germany, No. 69,382, dated July 3, 1893; France, No. 229,736, dated August 3, 1893, and Italy, dated May 17, 1893, Registrato al Vol. LXVI, No. 390, del Registro Attestati ed al Vol. XXVII, No. 34,003,) of which the following is a specification.

My invention relates to improved means for protecting ships against the attack of torpedoes and submarine boats.

One object of my said invention is to provide improved means whereby the torpedo guards or fenders of ships of war can be extended for defense more easily and expeditiously than heretofore and can be drawn in close to the skin of the ship or reefed and stowed outside the ship when not required for defense.

Another object of my said invention is to provide for the protection not only of the sides, but also of the bottom of the ship against the attack of torpedoes or the like.

The torpedo guards or fenders hitherto employed consist of a kind of trellis or netting, which is usually made in suitable lengths and is formed of wire-rope gromets connected by metal rings, the several lengths of trellis or netting being joined together by suitable shackles. These nets are suspended by screw-shackles from a ridge-rope, which is connected to the outer end of a series of swinging booms, whereby the guard or fender may be kept extended at the required distance from the side of the ship. When the guard or fender is not required for defense, the said nets are disconnected from each other and from the ridge-rope and are then folded or reefed and stowed on the deck of the ship. The operations of rigging out the swinging booms, shackling the nets together and to the ridge-ropes, and finally lowering and extending them involve a considerable expenditure of time and labor and necessitate the use of guys, stays, and tackles, some of which are above the line of fire of the guns and are therefore liable to be injured or destroyed by the shot from the guns. Moreover, such fenders or nets afford no protection to the bottom of the ship, as torpedoes or submarine boats can be made to pass under the said fenders or nets.

Now according to one part of my invention I combine hydraulic or other fluid-pressure cylinders and, if necessary, chains or wire ropes or hawsers or equivalent devices with the torpedo guard, fender, or net in such a manner that the same can be very readily lowered and pushed out from the ship into its operative position or drawn in and raised or reefed without the use of booms or tackle extending above the line of fire of the guns.

According to another part of my said invention I make a guard or fender of metal plates, which I attach to the hull of the ship and arrange in combination with operating devices, such as hydraulic or other fluid-pressure cylinders, with or without chains or ropes connected with lifting-gear, or their equivalent, whereby the said plates, when required for defense, can be moved outward from the hull of the ship into their operative position, and, when not so required, can be drawn in close to the hull in such a manner that they will not materially impede or interfere with the way or progress of the ship through the water. Moreover, I sometimes use torpedo-nets in conjunction with the said metal plates in such a manner as to completely protect the sides and bottom of the ship.

In the accompanying drawings I have shown how my said invention may be conveniently and advantageously carried into practice.

Figure 1 is a side elevation of a portion of a ship-of-war with my improvements applied thereto. Fig. 2 is a half midship section thereof, showing different arrangements of my improved apparatus hereinafter described. Fig. 3 is a similar view to Fig. 1, showing the parts in a different position. Fig. 4 is a half midship section showing other arrangements of my improved guard or fender. Fig. 5 is a side elevation, and Fig. 6 a plan, of the after part of a ship-of-war, showing the means for

protecting the stern thereof. Fig. 7 is a side elevation, and Fig. 8 a plan, of the forward part of a ship-of-war, showing the means for protecting the bow thereof. Fig. 9 is an end view, drawn to an enlarged scale, illustrating details of construction.

Like letters indicate corresponding parts throughout the drawings.

In applying the first part of my said invention to the torpedo guards or nets ordinarily used the nets A, instead of being suspended from swinging booms, as heretofore, are supported, raised, and lowered by means of steel-wire ropes B and C and hydraulic or other fluid-pressure cylinders D, the main lifting-ropes B being attached to the top of the nets, and the tricing-lines C being attached to the lower edge of the nets. These ropes may be passed over rollers or pulleys at the ends of the rams or pistons D′ of the fluid-pressure cylinders D and are then passed through suitable sheaves fitted either on the upper deck or in the ship's side, as may be most convenient, and are operated in any suitable manner, automatically or otherwise. In order to extend the said nets and push them out from the side of the ship, they are first lowered by paying out the steel-wire ropes B and C until the nets hang vertically at the side of the ship. They are then moved out to the required distance from the ship, as shown at A in Fig. 2, by the rams or pistons D′, the main and tricing lines being simultaneously paid out, if necessary. The rams or pistons D′ of the cylinders on either side of the ship may, if desired, be coupled together by means of connecting-rods E, over which the main and tricing lines are passed, and which keep the nets straight or taut throughout their length, these rods being provided with suitable rollers, if deemed necessary.

For moving the nets at the bow and stern of the ship into and out of their defensive posion I provide hydraulic or other fluid-pressure cylinders F, Figs. 5 to 8, the rams or pistons F′ of which are projected along the middle line of the ship. Each ram or piston F′ has attached to its end or head a ridge-rope F^2, connected to eyebolts E′ at the terminations of the connecting-rods E of the athwartship pistons D′, so that when the said piston or ram F′ is pushed out the said connecting-rods will be set taut and the cordon of nets completed.

When it is desired to retract and stow the nets, the main lifting-lines B and the tricing-lines C are hauled in, and the torpedo-nets A are drawn to the side of the ship by the rams D′. They are then reefed automatically or otherwise by the tricing-lines C and stowed outside the ship above the level of the water, as shown at A′.

When it is desired to protect both the sides and the bottom of the vessel, I provide a comparatively light collapsible shield or casing of steel plate or other suitable material, so constructed and arranged as to form a complete protection for the sides and bottom of the ship and corresponding to the shape thereof, which casing is divided longitudinally in the center and hinged or swiveled on each side to the keel, or otherwise suitably arranged, so that it can be readily moved into and out of its defensive position.

In the arrangement shown by the broken lines in Fig. 4 metal plates G are pivoted to the keel of the vessel in any convenient manner—for example, as shown in Fig. 9. These plates G are each provided with one or more movable extension-plates H J K, the said plates being connected by suitable hinge-joints at H′ J′ K′. The plates K are secured to the rams or pistons D′ of the hydraulic or other fluid-pressure cylinders D, whereby the plates K are moved away from the ship to the required distance, as shown by broken lines in Fig. 4, or, by a reverse movement of the said rams or pistons D′, are moved close up to the side of the ship, as indicated by full lines in Fig. 4. Chains or ropes L are connected to the extension-plates at the hinge-joints J′, the said chains or ropes being also connected with suitable lifting-gear worked by the engines of the ship, or separately by steam or other power, so that the lower parts of the outer casing can thereby be lowered into the position indicated by broken lines in Fig. 4, or raised up close to the skin of the ship, as indicated by full lines in Fig. 4. The plates G, H, J, and K are made about twenty feet in length, so as to form sections of the entire torpedo guard or fender. I thus provide for enabling any portion injured by attack to be readily removed and replaced.

The plates G may closely abut against each other or slightly overlap one another, and thus present but little, if any, resistance to the way of the ship, and the plates near the stem and stern of the vessel are connected with the stem and stern by means of stays or tie-pieces, so that when in their operative position they will be drawn through the water with the ship in an efficient manner. To prevent the water from flowing through the space between the said plates and the hull of the ship when the said plates are in their inoperative position during the progress of the ship through the water, I sometimes provide at the forward end and also, if desired, at the rear end of the guard or fender suitable flanged pieces or angle irons and plates, the angle-irons being secured to the ship's side and the plates being secured at one end to the said angle-irons and at the other end to the ship's side in such a manner as to maintain the continuity of outline of the vessel.

To facilitate the replacing of any of the plates when injured, I sometimes construct and arrange the parts of my improved guard or fender as hereinafter described—that is to say, I connect the plates G with the keel of the ship by means of hinge-pins M, made as shown in Fig. 9, and fitting into sockets N, extending longitudinally along the keel and

firmly secured thereto. The said sockets N throughout their length are open, as shown at N′, and the hinge-pins M are introduced into the said sockets in their proper position relatively to each other and to the ship, and the plates afterward secured to the said hinge-pins. The plates G can then be turned about the axis of their hinge-pins M to lower them into the position shown by broken lines in Fig. 4 and to raise them again into the position shown by full lines in Fig. 4. Should, however, either of the said plates G be injured so as to render it useless, it can be disconnected from the corresponding plate H, or the corresponding plate K can be disconnected from the ram or piston D′, and then, by allowing the plate G to turn about the axis of its hinge-pin M through a sufficient angle, as indicated on the right-hand side of Fig. 9, it may be allowed to become disengaged from the socket N, so that when released from the chain L the plate G or the entire section of the guard or fender will sink to the bottom of the water, and it can then be replaced by inserting the hinge-pin M of a new plate or section into the socket N, in the manner indicated on the right-hand side of Fig. 9, and then raising the said hinge-pin and securing the plate or section thereto, as above stated. I also make the hinge-joints H′ J′ K′, which connect the plates with each other, in such a manner that should either of the plates be injured so as to render it useless it can be readily disconnected and replaced by a new one. For instance, I make the said joints with hinge-pins, which can be readily withdrawn when necessary, the said hinge-pins being secured in place by means of split pins or other suitable devices.

In some cases I provide vertical hydraulic or other fluid-pressure cylinders P at the bilge and middle line, having rams or pistons P′, whereby this movable outer bottom plating or shield may be pushed downward from the ship, as shown by the finely-dotted lines in Fig. 4, so as to maintain an approximately uniform distance between the hull of the vessel and the shield at all parts thereof. These vertical cylinders are preferably secured to the wing and middle-line bulkheads, or, if desired, the deck-stanchions and hold-pillars may be converted into cylinders in which the rams or pistons P′ may work without unduly interfering with the other structural arrangements of the ship.

It will be seen that the plates G are bent outward near the joint H′. This arrangement enables me to dispense with the ropes or chains L when the vertical cylinders are employed, because, after the plates K have been drawn in close to the side of the ship, the upward movement of the rams or pistons P′ will not only raise the plates G up to the bottom of the ship, but will also cause the plates J and H to turn about their joints H′ K′ until they occupy the position indicated by full lines in Fig. 4.

I sometimes dispense with the plates H, J, and K and employ torpedo-nets A, arranged, as above described, in conjunction with the plates G, as shown in Fig. 2, or I connect the lower edge of the nets, as at A^2, to the upper edge of the plates G in such a manner as to form a continuous protecting guard or fender from the water-line to the keel on both sides of the vessel.

The plates G (shown by broken lines in Fig. 2) are pivoted to the keel and are raised and lowered by means of the ropes or chains L, which are attached to the upper edge of the said plates.

When vertical cylinders P are used, as shown in Fig. 3 and by the finely-dotted lines in Fig. 2, for raising and lowering the plates G, I provide the said plates with extension-plates G′, connected by hinge-joints at G^2 to the said plates G. In this case, after the plates G have been raised by the rams or pistons P′, the extension-plates G′ are raised and lowered by the ropes or chains L. In Figs. 1, 3, 5, and 7 the nets in their defensive position are shown by dotted lines.

When greater security is required in cases where the said guard is pivoted to the keel and to prevent any submarine torpedo-boat or torpedo passing or skipping under the guard or fender, I sometimes make the plates G with hinge-joints at a suitable distance from the keel, so that when the said plates are lowered the portions thereof next the keel will extend vertically downward therefrom, or I make the plates G with downwardly-projecting plates on their under sides, hinged or otherwise connected thereto.

By my said invention the torpedo guard, net, or trellis can be extended or retracted in less time and with less labor than hitherto and without liability to injury of any of the parts by the firing of the guns.

It is obvious that without departing from the nature of my invention I can somewhat modify the construction of my improved apparatus. For instance, I can, if desired, use movable arms or stays arranged midway between the rams or pistons D′ for the purpose of supporting the guard, fender, or net when in its defensive position, thus diminishing the number of cylinders and rams or pistons required.

The whole apparatus is, if desired, so arranged that it can be operated or controlled by the officer in charge from the bridge or conning-tower with the aid of electric, pneumatic, hydraulic, or other suitable apparatus.

I sometimes apply my improved apparatus to a ship in such a manner that all the parts thereof are below the water-line, as shown, for example, in Fig. 4. The guard or fender and the rams or pistons are thus protected against an enemy's fire. In other instances I apply the said apparatus, as shown in Figs. 1, 2, 3, and 5 to 8, so that the rams or pistons D′ are a short distance above the water-line.

What I claim is—

1. The combination, with a ship or vessel, of a torpedo-guard consisting of metal plates connected by horizontal hinge-joints, fluid-pressure cylinders arranged within the vessel, and rams or pistons working in the said cylinders and extending through the shell of the vessel, whereby the said guard is moved into and out of its defensive position, substantially as described.

2. The combination, with a ship or vessel, of a torpedo-guard consisting of nets supported by the horizontal pistons, and extending down to and connected with plates G, moved by the vertical piston and with the operating mechanism comprising fluid-pressure cylinders arranged within the vessel, carrying the rams or pistons which extend through the shell of the vessel, and operate as described to move the guard into and out of the defensive position, substantially as described.

3. The combination, with a ship or vessel, of a torpedo-guard, and operating mechanism comprising horizontal and vertical fluid-pressure cylinders arranged within the vessel and rams or pistons working in the said cylinders and extending through the shell of the vessel, whereby the said guard is moved into and out of its defensive position, substantially as described.

4. The combination, with a ship or vessel, of a torpedo-guard comprising metal plates pivoted to the keel by a hinge-joint, and ropes or chains for raising and lowering the said plates, substantially as, and for the purposes, above specified.

5. The combination, with the ship or vessel and the guard or fender composed of metal plates, of vertical fluid-pressure cylinders for lowering and raising the said guard or fender or portions of the same, substantially as, and for the purposes, above specified.

6. The combination, with a ship or vessel, of a torpedo guard or fender comprising metal plates connected with the keel by a hinge-joint consisting of a hinge-pin and a socket provided with a lateral opening for the introduction and disengagement of the said hinge-pin, substantially as, and for the purposes, above specified.

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