

(No Model.)

2 Sheets—Sheet 1.

A. W. MONTGOMERY-MOORE.

MECHANISM FOR CLOSING BULKHEAD DOORS ON SHIPBOARD.

No. 542,935.

Patented July 16, 1895.

Fig. 1.

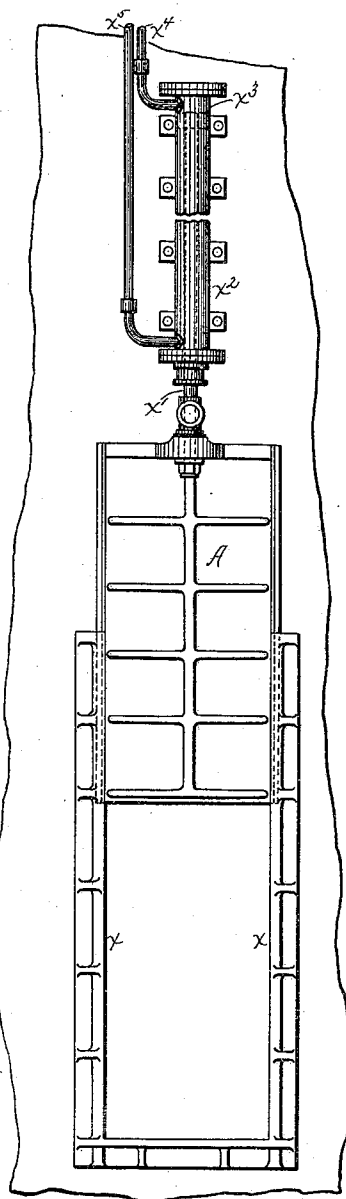


Fig. 2.

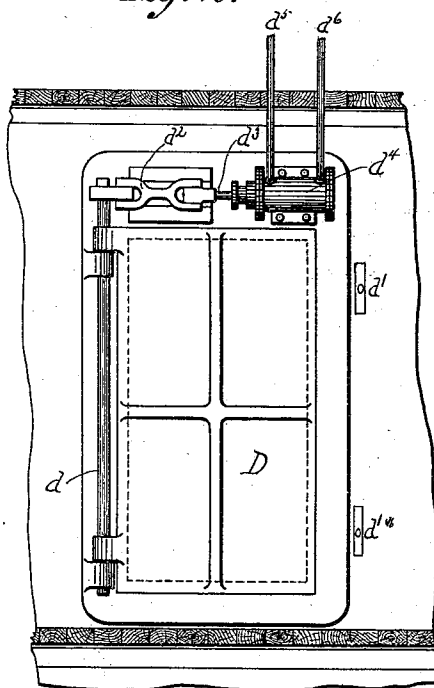
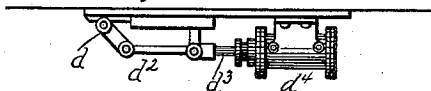


Fig. 2^a



Witnesses

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2 Sheets—Sheet 2.

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Fig. 3.

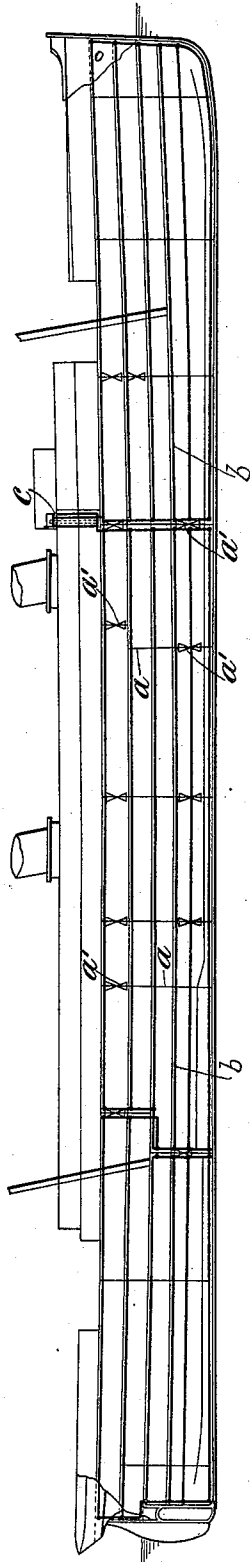
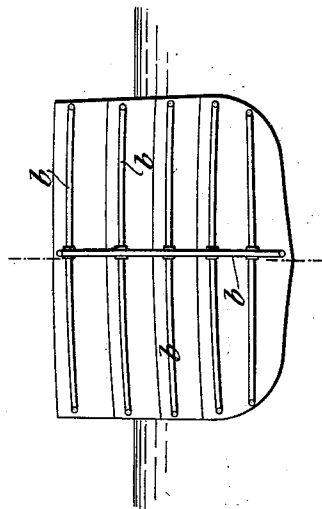


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER WILLOUGHBY MONTGOMERY-MOORE, OF LONDON, ENGLAND.

MECHANISM FOR CLOSING BULKHEAD-DOORS ON SHIPBOARD.

SPECIFICATION forming part of Letters Patent No. 542,935, dated July 16, 1895.

Application filed April 10, 1895. Serial No. 545,228. (No model.) Patented in England February 13, 1894, No. 3,133.

To all whom it may concern:

Be it known that I, ALEXANDER WILLOUGHBY MONTGOMERY-MOORE, gentleman, a subject of the Queen of Great Britain, residing at Holland Lodge, Eltham Road, Lee, London, in the county of Kent, England, have invented certain new and useful Improvements in Mechanism for Closing Bulkhead-Doors on Shipboard, (for which I have received Letters Patent in Great Britain, No. 3,133, dated February 13, 1894,) of which the following is a specification.

My invention relates to mechanism in connection with collision-doors by which they are thereby rendered self-closing when injury is done to the ship involving risk of foundering. By the same mechanism also groups of doors, or, if desired, all the doors in the ship, may at will be simultaneously closed by a single operation. The doors are arranged to close by gravity or by the pressure of water or other fluid exerted in a cylinder in connection with the door. In order that the closing may be automatically effected at the time required I lead a small pipe or pipes along the parts of the ship which are liable to be injured by collision—say all around the water line—and, if protection from rocks be desired, at the bow of the ship and also at her greatest draft. I arrange this pipe so as best to insure its being broken at the time when the injury to the ship is inflicted. I keep this pipe charged with fluid, or there may be a vacuum within it, so that in either case the pressure within differs from the pressure without. When the pipe is broken an equalization of pressure ensues, and this change of pressure causes movement in apparatus which I connect with the pipe, and this movement I utilize to bring about the automatic closing of the collision-doors.

In the accompanying drawings, Figure 1 shows a sliding door connected with mechanism arranged in accordance with my invention. Fig. 2 is a view of a hinged door in the side of a ship with my improvements applied. Fig. 2^a is a plan view of part of the mechanism connected with the door. Fig. 3 is a side view of a ship equipped with my improvements, the side of the ship being broken away to show the internal structure. Fig. 4 shows a transverse section thereof.

In Fig. 1 I have shown a vertically-sliding door A, moving in water-tight guides x and connected with a piston-rod x' , entering a cylinder x^2 and provided with a piston x^3 . Pipes x^4 x^5 connect with opposite ends of the cylinder on opposite sides of the piston, and these are connected with pipes b , (shown in Fig. 3 and hereinafter more particularly described,) which are distributed over the vessel where collisions are apt to occur.

In Fig. 2 the door D is hinged at d , and when closed is held by catches d' . The door is connected by links d^2 with a piston-rod d^3 , working in a cylinder d^4 , to the opposite ends of which are connected pipes d^5 d^6 , which may be connected to the pipes b above mentioned.

Under ordinary circumstances the doors are prevented from closing, or blocked, by water contained in the cylinders connected with them. So long as the water is closely confined at one end of the cylinder the piston cannot move or yield to the door in its tendency to close, (whether by gravity or by hydraulic pressure on the other side of the piston;) but if the water be able to escape the door closes promptly. The cylinder is placed in communication with the small protecting pipe or pipes above mentioned, and when these are broken in any part the water finds a free vent from the cylinder. To insure breakage of the pipe in case of collision, I propose to make such parts of it as are exposed to violence of cast-iron or earthenware or some such strong and brittle material, jointed not too rigidly. The pipes might be outside the ship; but I prefer that they should be inside and in close proximity to the sides. They should be sheltered from accidental damage except by collision, and be as accessible for inspection and repair as is consistent with other conditions. For charging the system of pipes and cylinders a pump is provided, and by means of this pump any leakage which may occur at the glands through which the piston-rods pass is made good from time to time.

I have spoken of water as the liquid with which the hydraulic system is charged, but in the higher latitudes it will be necessary to take precautions against frost, either by mixing with the water salts or materials which lower the freezing-point or by substituting a suitable oil or other liquid.

It is obvious that air or gas might be employed in place of liquid; also, that the arrangement might be so modified as to require a partial vacuum to be maintained in the system of pipes. The use of air-pressure or vacuum is to be recommended in positions where fittings or cargo might be injured by leakage. Again, it is by no means essential that the system of protecting pipes should be in direct communication with the hydraulic cylinders. The arrangement may be such that breakage of the pipes determines the opening of a valve to admit fluid under pressure to the cylinders, or moves some other part which causes power to be applied to close the doors. The arrangements which I have described in detail are, however, simple and efficient.

The general arrangement within the ship is illustrated by Figs. 3 and 4.

a a represent bulkheads, which divide up the ship into numerous compartments, and at *a' a'* are doors in the bulkheads arranged to close water-tight. These doors tend to close, as already explained, but are blocked open each by fluid contained in a cylinder.

b b b are the brittle pipes hereinbefore referred to. They communicate with the various cylinders, and fluid pressure is maintained within them so long as the apparatus is in use and the pipes are undamaged. When a breakage takes place from collision or otherwise the pressure is no longer maintained in the pipes *b* or in the parts of the cylinders connected with them. Consequently the doors close, which previously were held open by the fluid in these cylinders. The drawings show the pipes *b* arranged in three separate sets—a bow set, a stern set, and a midship set—so that the closing of the doors may be localized to the position of the injury.

At *c* are arrangements to relieve the pressure in the pipes, and so to permit the doors to close while the pipes remain whole and intact.

When sliding doors are used, water-tight guides or inclines may be used, as before described, and obvious precautions should be taken to prevent the doors closing too rapidly.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A ship provided with collision doors in combination with blocking mechanism for holding the doors open and a system of breakable pipes connected with the blocking mechanism containing a fluid, the pressure of which differs from the external pressure, the arrangement being such that the breakage by collision of the pipes releases the blocking mechanism and allows the doors to close.

2. A ship provided with collision doors in combination with door-closing mechanism, and a system of breakable pipes arranged around the ship connected to the door-closing mechanism and charged with a fluid to a pressure differing from the external pressure, the arrangement being such that the opening or breakage by collision of the pipes starts the door-closing mechanism.

3. A ship provided with collision doors in combination with means for closing the doors, fluid-containing cylinders, pistons connected with the doors and working in the cylinders, and devices distributed around the ship and connected with the fluid-containing cylinders for automatically releasing the fluid to permit the doors to close.

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Witnesses:

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