

(No Model.)

3 Sheets—Sheet 1.

W. F. BEART.

APPARATUS FOR STOPPING LEAKS IN SHIPS AT SEA.

No. 539,023.

Patented May 14, 1895.

Fig. 2.

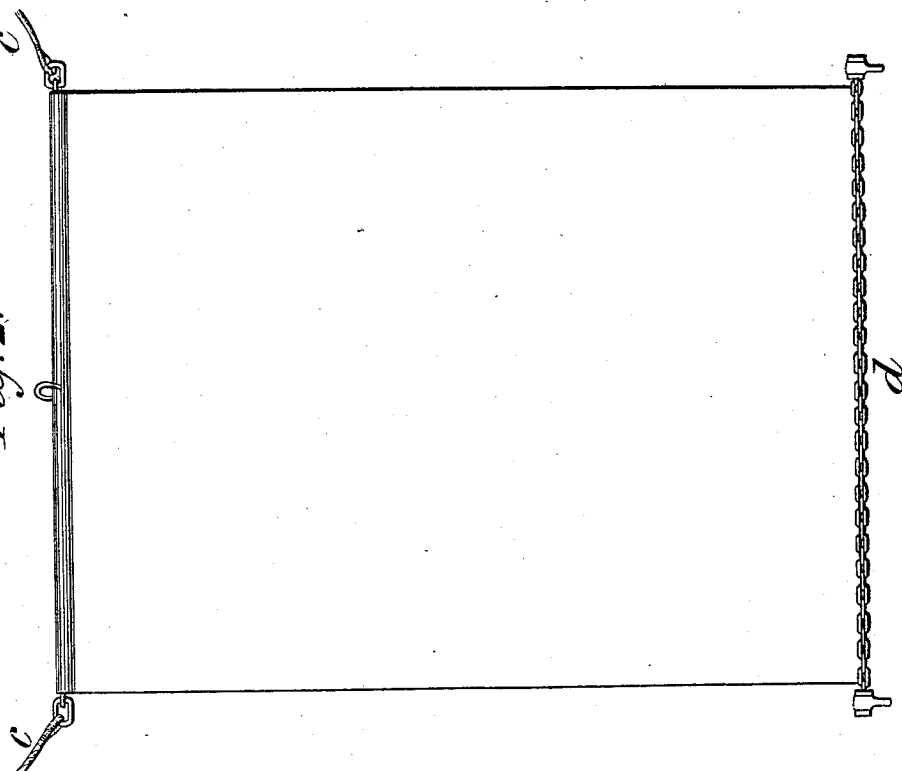
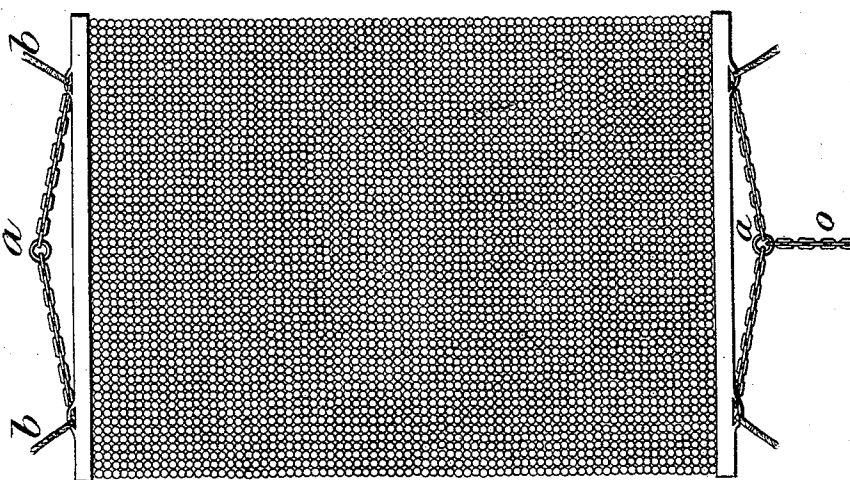


Fig. 1.



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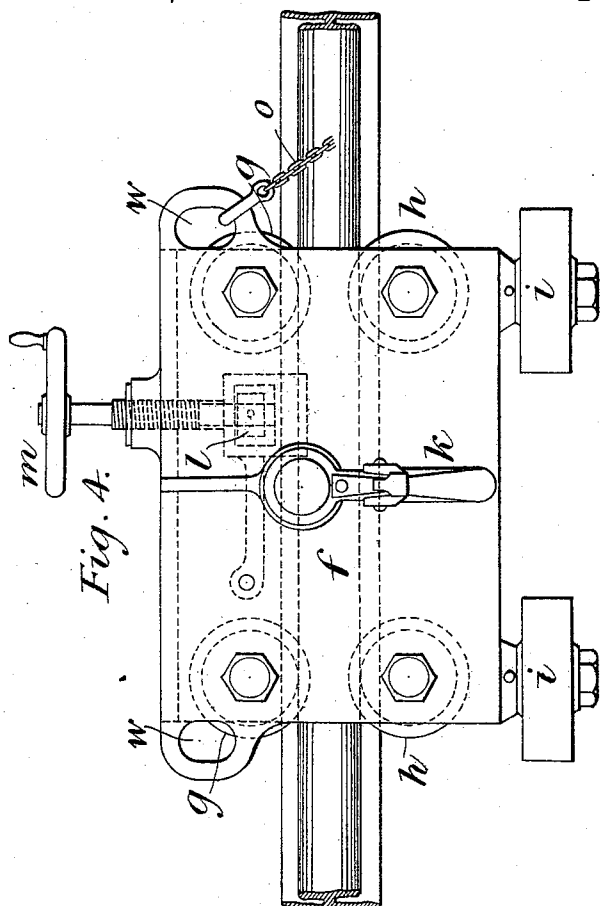


Fig. 4.

Fig. 3.

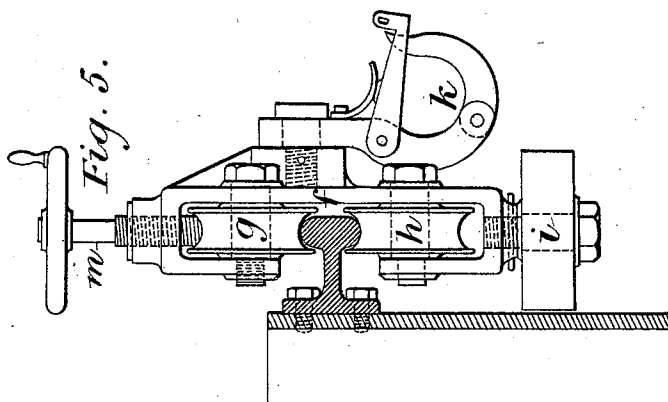
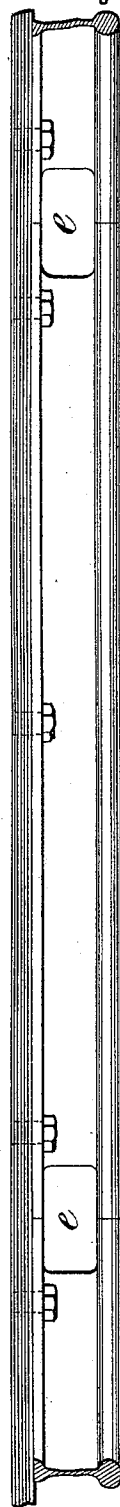


Fig. 5.

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Fig. 6.

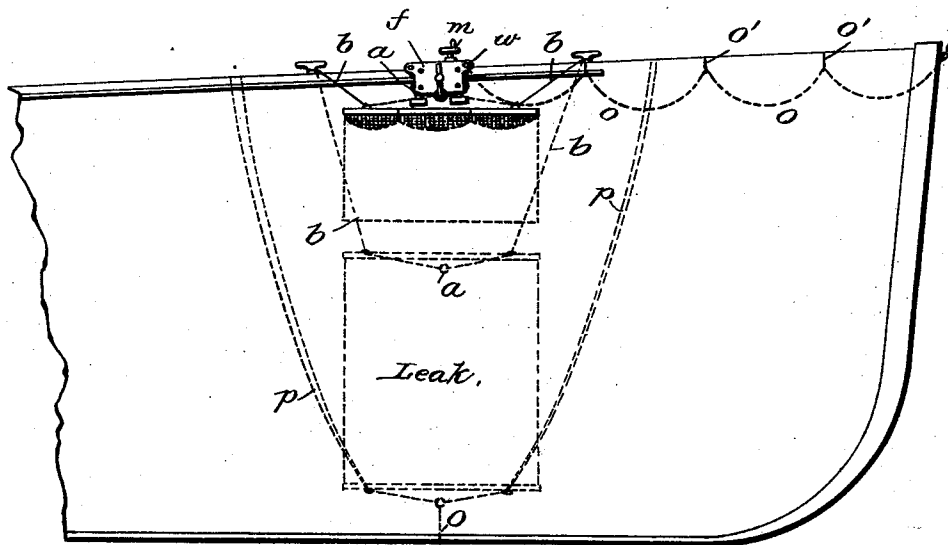
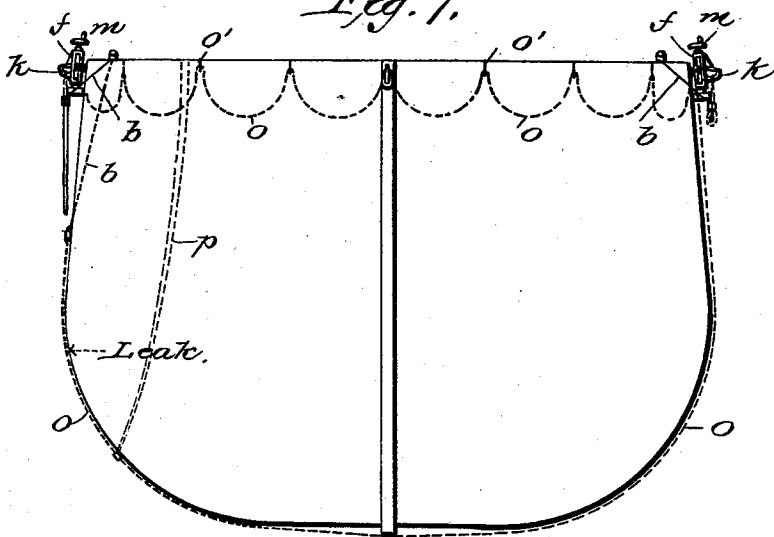


Fig. 7.



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APPARATUS FOR STOPPING LEAKS IN SHIPS AT SEA.

SPECIFICATION forming part of Letters Patent No. 539,023, dated May 14, 1895.

Application filed October 29, 1894. Serial No. 527,258. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FREDERICK BEART, gentleman, a subject of the Queen of Great Britain, residing at Godmanchester, in the county of Huntingdon, England, have invented certain new and useful Improvements in Apparatus for Stopping Leaks in Ships at Sea, of which the following is a specification.

In order to stop leaks in ships at sea I provide the following apparatus: First. A skeleton collision mat consisting of a strong metallic open work sheet to be first spread over the damaged part. This is best formed like a torpedo net of interlaced rings of wire or metal. It offers no obstruction to the water and hence is got into position with comparative ease. Second. A cover mat preferably of strong closely woven fabric such as sail cloth which is sufficiently water tight and is strong enough to sustain the water pressure when supported by the skeleton mat against which it is to be spread. Third. A flat footed rail like a railway rail is fixed on the outer side of the ship as high out of the water as convenient. Through the horizontal web of this rail holes are formed at short intervals for the passage of ropes. Fourth. A carriage capable of running along the rail from end to end of the ship. The carriage is provided with a brake and with a disengaging hook. It serves to carry the skeleton mat and also a chain called the "bow chain" to the place where required for use.

The apparatus above referred to is provided in duplicate, one set for each side of the ship. Various ropes and other appliances are also provided as hereinafter mentioned.

The above mentioned apparatus is represented by the annexed drawings. These I will describe and afterward I will explain more fully the way in which the apparatus is intended to be used.

Figure 1 shows the skeleton mat. It may be made of various dimensions, but a width of fourteen feet and a depth of twenty feet will be suitable. It is stiffened at its top and bottom edges by iron plates. The rings of which the mat is constructed may be, say, three inches in diameter. There are eyes near the four corners of the mat, and these are connected by chains with rings *a a*, one at the top and one at the bottom, as shown. The

skeleton mat has two hempen ropes *b b*, attached near its upper corners.

Fig. 2 shows the cover mat of sail-cloth or an extra-strong woven fabric. It is somewhat larger than the skeleton mat in both dimensions. It has cords *c c* attached at its upper corners. The lower edge of the cover-mat is weighted with a chain *d*, made fast to it. It serves to make it sink rapidly, and also serves as a core to roll the cover-mat upon.

Fig. 3 shows a plan of the rail fixed to the ship's side, the latter being represented in section. The rail may be in short lengths, as shown. *e e* are openings for passing ropes.

Fig. 4 shows a front elevation, and Fig. 5 an end elevation, of the carriage. The rail and ship's side appear in section.

Figs. 6 and 7 are diagrams illustrating how the leak-stopping apparatus is applied to a ship.

f is a frame or casting provided with two wheels *g, g*, bearing on the top of the head of the rail and two other similar wheels *h, h*, underneath the head of the rail; also the carriage has two horizontal wheels *i, i*, which bear against the ship's side and keep the carriage upright or parallel to it.

k is a large releasing hook on the outboard side of the carriage. On this hook the carriage supports its load.

l is a brake block jointed to the frame of the carriage and capable of being forced down on to the rail by a hand screw *m*.

The normal arrangement of this apparatus on shipboard is as follows:—The skeleton mat is hung from the carriage, the mat being doubled and the two rings *a, a*, being on the releasing hook *k*. The mat is also further folded and secured by a lashing which can readily be cut immediately there is any prospect of the apparatus being required for use. The hempen ropes from the upper corners of the skeleton mat are led up through the holes *e* in the rail and made fast to cleats inboard. There is a bow chain *o* which passes from one carriage to the other around the bow outside the ship. The bow chain is kept up out of the water by ties of rope yarn *o'* which temporarily hold it or it may be supported in any other convenient way. The ends of the bow chain are hooked or shackled on to the eyes *w* of the carriages. The cover mat is kept

rolled up in any convenient place where it is accessible at a moment's notice.

When the apparatus is required for use the bow chain is to be attached to the ring *a* connected with the lower plate of the mat on that side of the vessel which has received damage and at the same time on the side of the ship which is remote from the damage. The releasing hook *k* is made to drop the mat which then remains supported by the ropes *b b*. Both carriages can now proceed toward the leak, the bow chain having been dropped into the water.

Assuming that the skeleton mat can be brought by the carriage to the place required all that is necessary in placing this mat is to make fast the top ropes *b b* so as to allow the length of drop required and then to open the delivery hook *k* and permit the mat to drop. Before however this is done, strong cords *p* should be attached to the eyes on the bottom plate. All being now ready the bow chain is hauled in from the other side until the skeleton mat is held closely to the ship's bottom. The skeleton mat having thus been placed and the bow chain hauled taut all is ready for spreading the cover mat. This mat being light there is little difficulty in handling it. The roll is passed overboard and it is fastened with cords so as to retain the upper edge in the position required. Then the cover mat is allowed to unroll (controlled if needed by cords attached to the ends of the chain *d*) and as the roll descends it is held sufficiently close to the skeleton mat by the cords which have been attached to the eyes on the lower plate of the net. The water pressure insures the close application of the cover mat to the damaged part of the ship's side and the skeleton mat provides the necessary strength to sustain this pressure. The skeleton mat also presents a sufficiently even and continuous surface for spreading the cover mat, while the skeleton mat itself is spread with comparative ease in consequence of its giving free passage to the water through it.

If owing to damage of the guide rail or side of the ship the mat cannot be brought quite into the requisite position it can easily be shifted by tackle.

What I claim is—

1. In an apparatus for stopping leaks in

ships, a flexible, skeleton or reticulated mat adapted to be folded, and provided with devices for supporting it when folded and for securing it to the side of the vessel, and a water-tight, flexible mat adapted to be rolled or folded and provided with devices for securing it over the skeleton mat when the latter is placed over a leak.

2. Apparatus for conveying and placing a collision mat, such apparatus consisting of a rail fixed to the side of the ship and a carriage with a disengaging hook, for releasing said mat and with wheels above and below the rail, and also wheels bearing against the ship's side.

3. In an apparatus for stopping leaks in ships, the rails fixed to the ship's side, the carriages carrying a collision mat and having disengaging hooks for releasing the same and running on the rails, the bow chain and the collision mat held by the carriages to be carried by them to the place where they are required for use.

4. In an apparatus for stopping leaks in ships, the supporting carriage adapted to be moved from place to place, along the side of the ship, a flexible, skeleton or reticulated metallic mat supported by the carriage, adapted to be folded and provided with devices for securing its lower end to the carriage when folded, and a water-tight cover mat provided with devices for securing it over the skeleton mat when the latter is placed over a leak.

5. In an apparatus for stopping leaks in ships, a flexible, skeleton or reticulated mat, a carriage adapted to be moved from place to place to which the upper end of the skeleton mat is secured, devices for supporting the mat when folded, ropes attached to the lower edge of the skeleton mat and adapted to be drawn taut to hold it against the side of the vessel over the leak, and a water-tight cover mat adapted to be suspended from the top of the vessel and provided with ropes at its lower end which, when drawn taut, hold it securely against the skeleton mat.

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