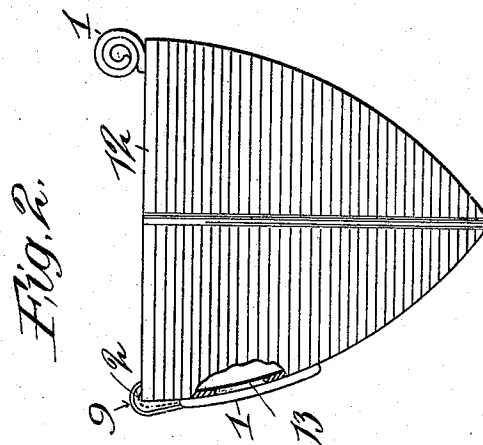
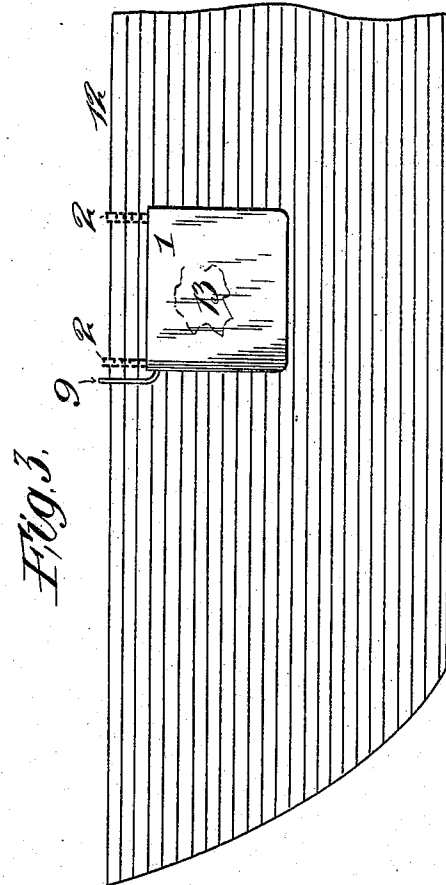
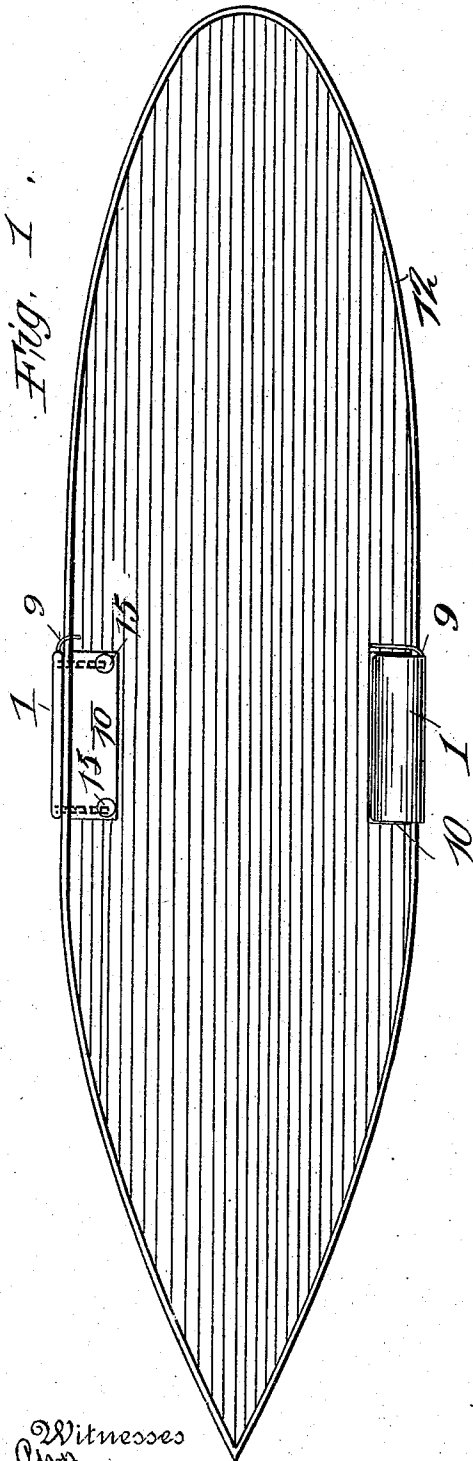


J. H. REINHARDT.
 MEANS FOR BUOYING SHIPS OR CLOSING HOLES THEREIN.
 APPLICATION FILED OCT. 1, 1906.

932,720.

Patented Aug. 31, 1909.
 2 SHEETS—SHEET 1.



Witnesses
 C. H. Benjamin
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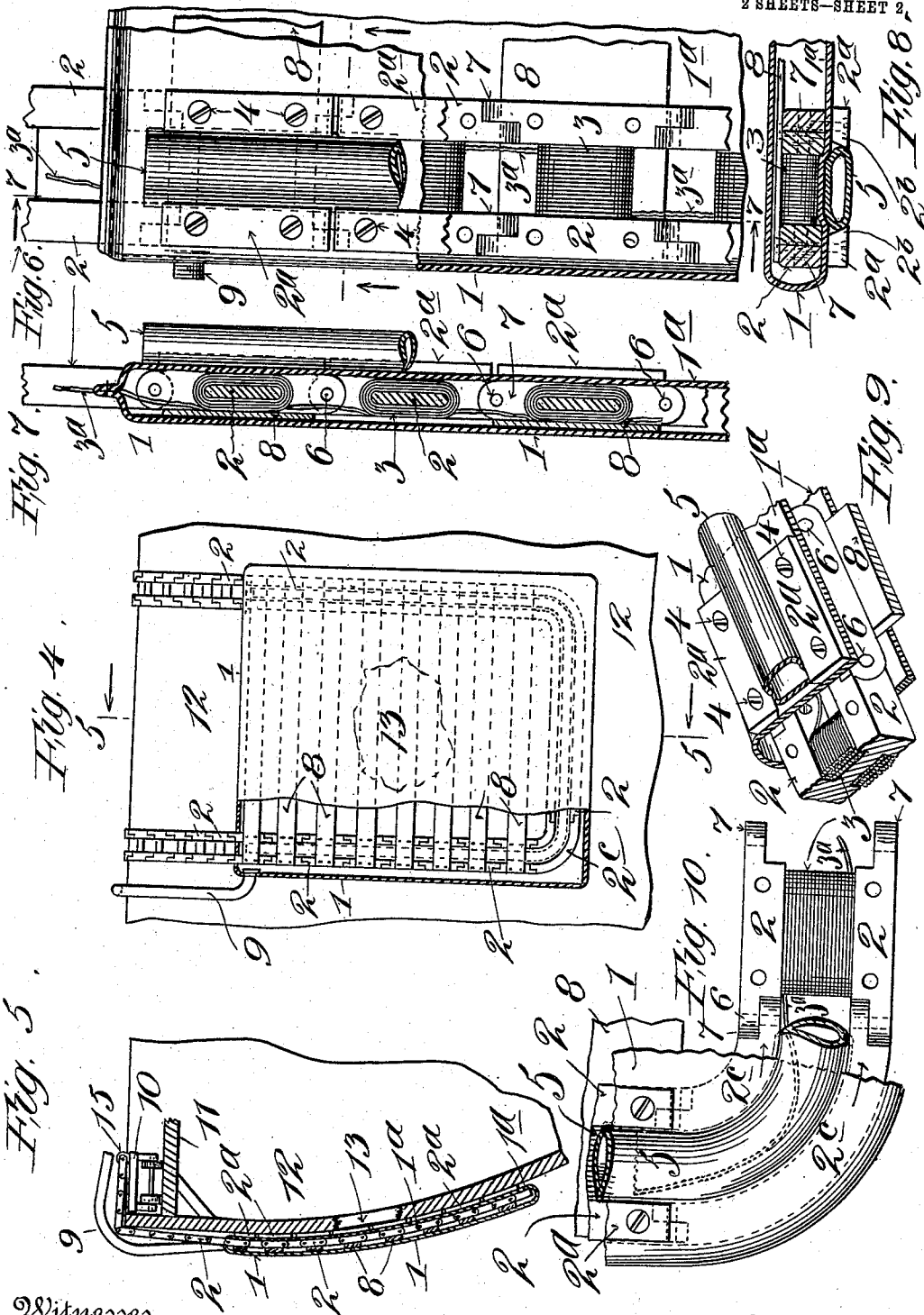
Inventor
 J. H. Reinhardt
 By his Attorney
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UNITED STATES PATENT OFFICE.

JAMES H. REINHARDT, OF EAST ORANGE, NEW JERSEY.

MEANS FOR BUOYING SHIPS OR CLOSING HOLES THEREIN.

932,720.

Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed October 1, 1906. Serial No. 336,851.

To all whom it may concern:

Be it known that I, JAMES H. REINHARDT, a citizen of the United States, residing in East Orange, county of Essex, New Jersey, have invented certain new and useful Improvements in Means for Buoying Ships or Closing Holes Therein, of which the following is a specification.

When ships run aground or sink it is sometimes necessary to remove more or less of the load, or attach floats to the ship from which water is pumped, in order to lighten or raise the ship to permit it to float free from the sand bar or rocks, and when a hole has been stove in a hull canvas or sails have been placed over the hole to prevent the inrush of water. But it frequently happens that the necessary appliances for the above purpose are not at hand or weather conditions preclude their use as quickly as necessary, with consequent loss and injury.

The object of my invention is to provide an appliance which may be carried aboard a ship or other vessel and may be thrown overboard when necessity may arise and be securely and quickly attached to the exterior of the ship, and to permit the appliance to be inflated with air to increase the buoyancy of the ship to assist in raising it or clearing it from the sand or other obstruction, and when a hole is stove in the ship to permit the appliance to be fastened to the outside of the ship over the hole to prevent the inrush of water, whether the appliance be inflated or not.

In carrying out my invention I provide a sheet, blanket or casing of flexible material, such as canvas, or the like, practically impervious to water, adapted to fit along the outside of the hull, and to said sheet or blanket I attach suitable magnets which are adapted by magnetic attraction to adhere to the iron or steel hull and thereby secure the sheet or blanket thereto. When the sheet or blanket is so secured to the hull over a hole therein it will prevent the inrush of water. The blanket is preferably made hollow as in the nature of a bag, adapted to be inflated with air, (which may consist of rubber and canvas combined to hold air under pressure), and by preference the magnets and their wires are secured within the blanket to prevent access of water thereto. In order to have the magnet poles exert the

greatest possible magnetic action directly against the metal hull of the ship I secure the material of the blanket to the magnets between the cores and separable pole pieces, as by iron screws of relatively large dimensions passing through the pole pieces and blanket and into the cores, whereby the pole pieces will be on the exterior of the blanket and the magnets on the interior thereof. The magnets extend along the sides and bottom portion of the blanket in the manner stated, and their wires that extend without the blanket will be insulated from the water, as by rubber insulation, and connected with a suitable source of electrical energy, as aboard the ship. For convenience, the blanket with its magnets may be kept rolled on deck and when required for use can be moved to the proper place and rolled overboard, the current is then passed through the wires of the magnets, and the magnets thereupon will cling to the hull and hold the blanket securely thereto.

Other novel features embraced within my invention will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming part hereof, wherein,

Figure 1 is a diagrammatic view of a ship equipped with my improvements, Fig. 2, is a view looking at the bow of the ship, part broken away, Fig. 3 is a side view, showing my improvements in position at the side of the ship, Fig. 4 is an enlarged view, partly broken away, illustrating my improvements sustained at the side of the ship, Fig. 5 is a vertical section, substantially on the line 5, 5, in Fig. 4, Fig. 6 is an enlarged detail face view of a portion of my improvements, part being broken away disclosing the arrangement of the magnets, Fig. 7 is a vertical section on the line 7, 7, in Fig. 6, Fig. 8 is a horizontal section of Fig. 6, Fig. 9 is a detail perspective view, and Fig. 10 is a detail view, partly broken, illustrating an arrangement of magnets at the corners of the protecting or buoying appliance.

Similar numerals of reference indicate corresponding parts in the several views.

In the drawings the numeral 1 indicates, generally, my improved buoying and protecting appliance comprising what I term a "blanket" shown, generally, in the form of an inflatable bag within which is located a series of magnets 2, the windings 3 of which

are shown arranged in series, although they may be in parallel, or connected in any other suitable manner for energizing more or less of the magnets simultaneously. The blanket or bag 1 may be made of canvas or other strong material impervious to water or to air, such as canvas and rubber combined.

The magnets 2 are secured to one or both walls of the blanket or bag, and in the arrangement illustrated I have shown the pole pieces 2^a of the magnets as located on the exterior of the blanket so that the blanket wall 1^a lies between the magnet cores and the poles 2^a, screws 4 passing through said pole pieces, through the blanket wall, and secured in the sides of the cores of the magnets, serving to securely connect the blanket and magnets together. The screws 4 of iron are preferably to be as large as possible to obtain the best magnetic efficiency possible in addition to the magnetic attraction of the pole pieces 2^a. I have shown each magnet as provided with two pole pieces 2^a providing a space between them and within or in line with said spaces I provide a tube or pipe 5, which may be made of rubber or canvas, adapted to bear against the ship's hull and be held firmly in place by the clinging of the magnets to the hull to afford practically water tight joints around the blanket or bag where immersed.

As shown in Fig. 8, the inner sides of the pole pieces 2^a are undercut at 2^b providing the sides of the spaces receiving the tube or pipe 5 with inwardly diverging walls into which the pipe 5 may spread when pressed against the ship's hull to assist in holding the tube in place. By thus securing the magnets to the flexible blanket and making such magnets relatively short they will follow quite closely the contour of the ship's hull when attached thereto to assure as tight joints as possible all around the margin of the blanket. The adjacent magnets may also be pivotally connected together, for which purpose I have shown their ends abutting and attached by rivets 6 passing through the hinge-like or projecting portions 7 of the magnets.

The magnets by being directly hinged together serve in a measure as one continuous magnet from end to end of the series of magnets, and also are thus organized in the nature of a chain having flexibility and strength, the pivots 6 with respect to the magnets extending in the direction of the length of the ship when applied thereto, so that the magnets may readily swing toward the hull for ready attachment thereto by magnetic attraction, and the magnets may thus serve in supporting the blanket. To assist in sustaining the weight of the lowermost series of magnets 2 as well as to provide magnets at the lower corners of the blanket I have shown the lowermost corner

magnets, at 2^c, as curved and pivoted to the horizontal and vertical adjacent series of magnets, as by pivots 6, which also serve to guide the pipe 5 around the lower corners of the blanket to maintain tight joints against the ship's hull at such corners, as shown in Figs. 4 and 10.

To keep the blanket distended or spread in the direction of the length of the ship I have shown cross strips or stays 8 attached to and extending between the vertically disposed series of magnets 2, so that said strips or stays extend in the direction of the length of the ship, which strips or stays may be non-magnetic material, such as brass or wood. These strips or stays may be secured to the sides of the magnet cores by screws, and preferably on the faces of such cores opposite the pole pieces 2.

At 9 is indicated a pipe connected air tight with the interior of the blanket or bag 1, through which air may be pumped for inflating the latter. The leads 3^a of the wires 3 should be insulated against the action of the water, as by rubber insulation and will be connected with any suitable source of electrical energy, either aboard the ship or elsewhere.

As the blanket and its magnets 2 are flexible the appliance may be rolled up for convenient storage on the ship, as indicated diagrammatically as in Figs. 1 and 2, for convenient handling of the appliance, which may be carried upon a suitable car or truck adapted to travel along the deck of a ship 12, so as to be readily moved to any desired position along the rail of a ship as required. The magnets 2 where they extend from the blanket, may be secured to said truck or car, as at 15, in Fig. 5, as a convenient means for holding the appliance at the deck and when thrown overboard, and the truck, if necessary, may be secured on deck during such use by lashing it thereto, or in any suitable manner. Magnets may be provided along the top edge of the blanket if desired, although such edge may be above the water line without magnets.

My improvements may be used as follows: If the ship has run aground one or more of the appliances may be thrown overboard at the desired part of the ship, say on opposite sides thereof, the current turned on and the magnets will quickly adhere to the metal hull of the vessel and thus hold the blanket securely thereto at the sides and bottom portion of the blanket, and then the blanket can be inflated with air as much as desired whereby the buoyancy of the ship will be increased to lift it to a higher level in the water and permit it to be floated away from the obstruction. To this end the appliance may be of any desired dimensions, both as to area and thickness, according to the requirements of the ship, and furthermore any

desired number of such blankets may be carried on the ship. Blankets on opposite sides of the ship may be connected by the pipes 9 with the same pump to inflate them simultaneously and at equal pressures, or they may be connected together directly by pipes 9 or by separate pipes to maintain equal pressure therein, so that if air should flow from one blanket the air in opposite connected blankets would equalize to maintain the ship level.

If a hole should be stove in the hull of the ship, (indicated at 13) the blanket will be thrown overboard, as before explained, in line with the hole, as indicated in Figs. 2, 3, and 4, and the magnets will hold the blanket securely in position over the hole to prevent the inrush of water. By having the blanket securely attached to the ship by the magnets danger of the blanket being displaced during travel of the ship is avoided, and as the pipe 5 makes a relatively tight joint against the hull around the margin of the blanket below the water level comparatively little, if any, water will leak into the ship through the hole, and thus the ship may be saved. Temporary repairs may be made on the interior of the ship at the hole while the latter is protected by the blanket. The advantages of the use of my improvements will be obvious, as the blanket may be quickly applied and it is not necessary for a sailor or diver to go into the water to apply a sail or other protector over the hole in the ship, for by merely throwing the appliance overboard into proper position and passing the current through the magnet wires the blanket may be quickly applied in position to protect the hole. When used to protect a hole, as stated, the blanket may be inflated more or less, or not at all, as circumstances may require, but by inflating the blanket in line with the hole in the ship the inner wall of the blanket will be caused to more closely hug the hull of the ship and practically protrude into the hole affording further restriction to inflow of water.

While I have illustrated and described magnets of suitable construction to be energized by the electric current, it is obvious that permanent magnets could be used, especially on ships not equipped with electric generating apparatus, but I deem it more advantageous to provide magnets of the class set forth as they may readily be magnetized and demagnetized as required. Furthermore, the arrangements shown and described may be altered and varied within the scope of my invention and without departing from the spirit thereof.

I have used the term "blanket" in a broad sense, by which I mean flexible material of suitable size and shape, practically impervious to water or air, whether in a single thickness such as a sheet, or hollow in

the nature of a bag, such as is adapted to fit against a ship's hull and follow the contour thereof.

Having now described my invention what I claim is:

1. An appliance of the character described comprising a blanket of flexible material having a hollow interior and provided with magnets located within the blanket and having pole pieces exterior to the blanket, adapted to adhere to a vessel's hull.

2. An appliance of the character described comprising a flexible blanket adapted to fit against a ship's hull, magnets connected with the blanket having windings within the blanket and pole pieces exterior thereto to adhere to said hull, and a flexible pipe carried on the exterior of the blanket adapted to be pressed against the ship's hull by said magnets to make tight joints at the hull.

3. An appliance of the character described comprising a hollow blanket of flexible material adapted to fit against a ship's hull, and magnets having windings carried within said blanket and pole pieces exterior thereto to hold the blanket against the hull by magnetic attraction and a circuit for the magnets leading through the blanket above the water level.

4. An appliance of the character described comprising a hollow air tight blanket of flexible material adapted to fit against a ship's hull, magnets having windings carried within said blanket and exterior pole pieces to hold the blanket against the hull by magnetic attraction, and flexible material connected with the blanket on the exterior thereof to be pressed against the ship's hull.

5. An appliance of the character described comprising a hollow air tight blanket of flexible material adapted to fit against a ship's hull, magnets carried within said blanket and having exterior pole pieces to hold the blanket against the hull by magnetic attraction, and means to inflate said blanket.

6. An appliance of the character described comprising a hollow blanket of flexible material adapted to fit against a ship's hull, and magnets having windings carried within said blanket to hold the blanket against the hull by magnetic attraction, said magnets having pole pieces secured thereto on the exterior of the blanket.

7. An appliance of the character described comprising a hollow blanket of flexible material adapted to fit against a ship's hull, magnets having windings carried within said blanket to hold the blanket against the hull by magnetic attraction, said magnets having pole pieces secured thereto on the exterior of the blanket by iron screws passing through the blanket and entering the magnet cores.

8. An appliance of the character de-

- scribed comprising a hollow blanket of flexible material adapted to fit against a ship's hull, magnets having windings carried within said blanket to hold the blanket against the hull by magnetic attraction, and a flexible pipe secured on the exterior of the magnets to engage a ship's hull and to be pressed against said hull by the magnets.
9. An appliance of the character described comprising a hollow blanket of flexible material adapted to fit against a ship's hull, magnets having windings connected in series and carried within said blanket near the edges thereof to hold the blanket against the hull by magnetic attraction, and pole pieces for the magnets secured on the exterior of the blanket.
10. An appliance of the character described comprising a hollow blanket of flexible material adapted to fit against a ship's hull, magnets having windings connected in series and carried within said blanket to hold the blanket against the hull by magnetic attraction, pole pieces secured to the magnets on the exterior of the blanket and having spaces between the adjacent pole pieces, and a flexible pipe located in said spaces to be pressed against a ship's hull.
11. An appliance of the character described comprising a hollow blanket of flexible material adapted to fit against a ship's hull, magnets having windings connected in series and carried within said blanket to hold the blanket against the hull by magnetic attraction, pole pieces secured to the magnets on the exterior of the blanket and having spaces between the adjacent pole pieces, and a flexible pipe located in said spaces to be pressed against a ship's hull, the inner sides of said pole pieces being undercut providing inwardly diverging spaces to receive said pipe.
12. An appliance of the character described comprising a blanket of flexible material substantially impervious to water, and a series of magnets connected with said blanket at the sides and bottom thereof, said magnets on the sides being pivotally connected together.
13. An appliance of the character described comprising a blanket of flexible material substantially impervious to water, a series of magnets connected with said blanket at the sides and bottom thereof, said magnets on the sides being pivotally connected together, and pole pieces secured to the magnets on the exterior of the blanket.
14. An appliance of the character described comprising a blanket of flexible material substantially impervious to water, and a series of magnets secured to the blanket, the adjacent ends of adjoining magnets being pivotally connected together.
15. An appliance of the character described comprising a blanket of flexible material substantially impervious to water, and a series of magnets secured to the blanket, the adjacent ends of adjoining magnets being pivotally connected together, and pole pieces secured to the magnets on the exterior of the blanket.
16. An appliance of the character described comprising a hollow flexible blanket impervious to air and water, a series of magnets within said blanket located near its edge, a pipe leading to the interior of the blanket, and stays connected with the blanket for maintaining it spread.
17. An appliance of the character described comprising a flexible blanket substantially impervious to air and water, and a series of magnets secured to the vertical sides and the bottom of the blanket, and corner magnets of curved form connecting the side and bottom magnets respectively.
- JAMES H. REINHARDT.
- Witnesses:
T. F. BOURNE,
WINFIELD BONYNGE.