H. FLÜGELTAUB.

DEVICE FOR STOPPING LEAKS IN BOATS.

APPLICATION FILED SEPT. 18, 1912.

1,060,177.

Patented Apr. 29, 1913.

3 SHEETS—SHEET 1.

Fig. 8

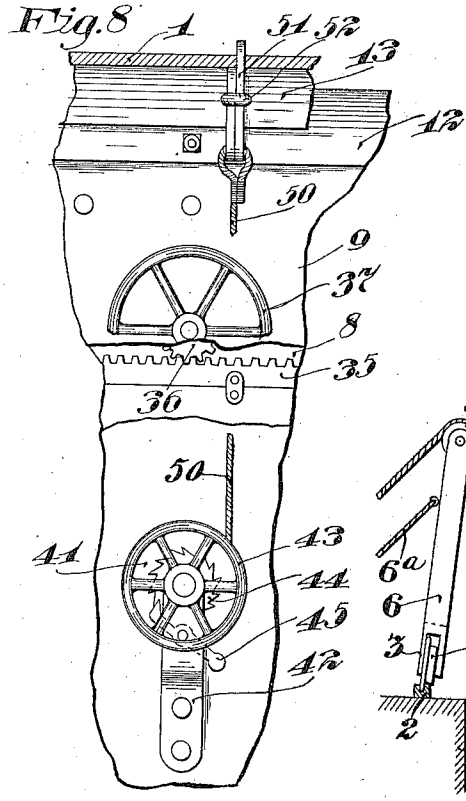


Fig. 5

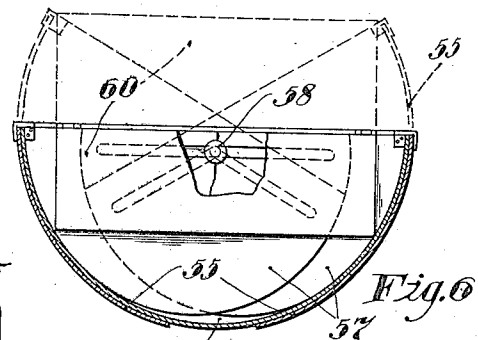
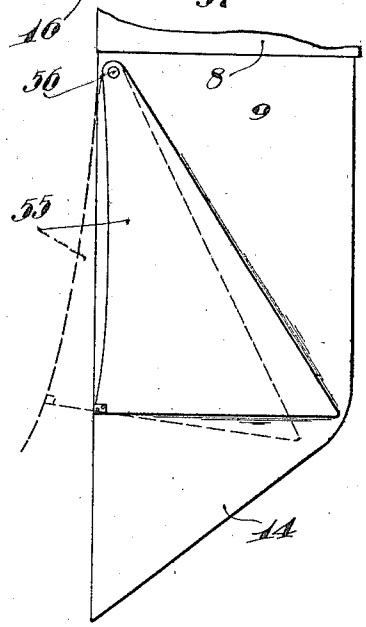


Fig. 6



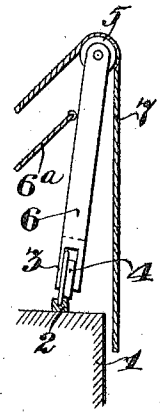
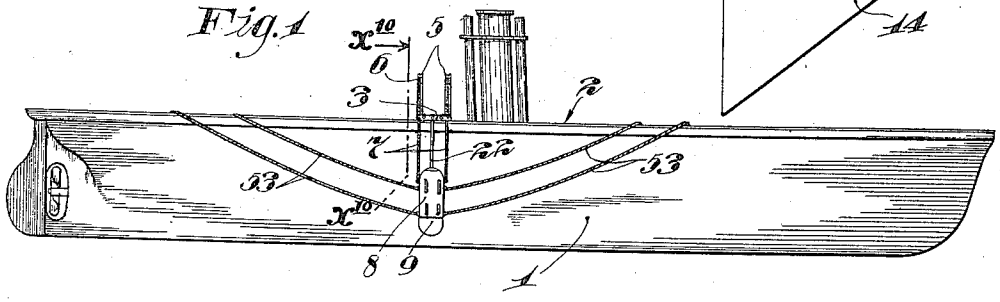


Fig. 10.

Fig. 1



Witnesses;

Geo. Knutson

E. C. Skinkle

Inventor;

Herman Flügeltaub

By his Attorneys;

Williamson & Merchant

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3 SHEETS—SHEET 2.

Fig. 3

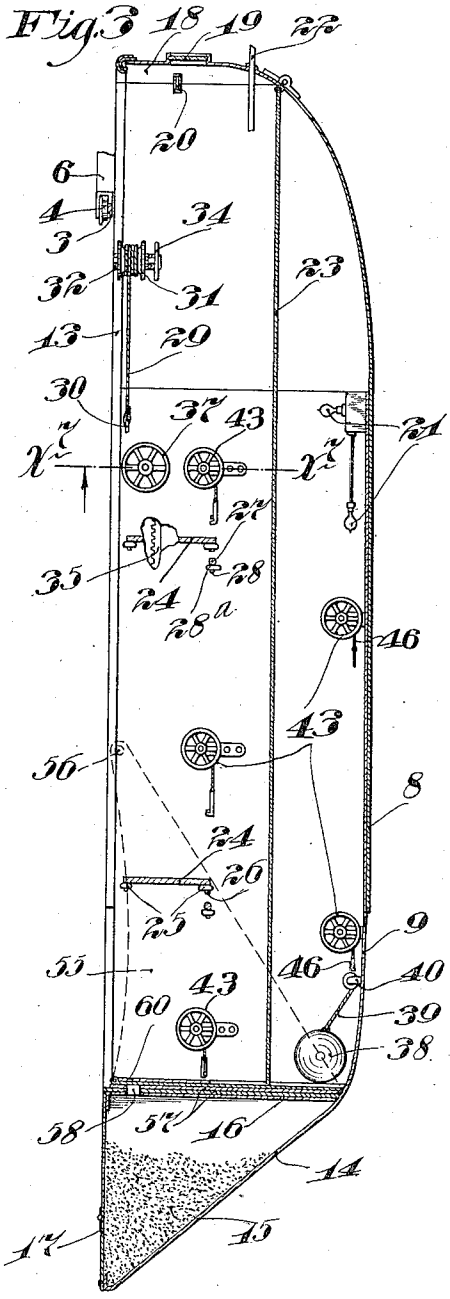
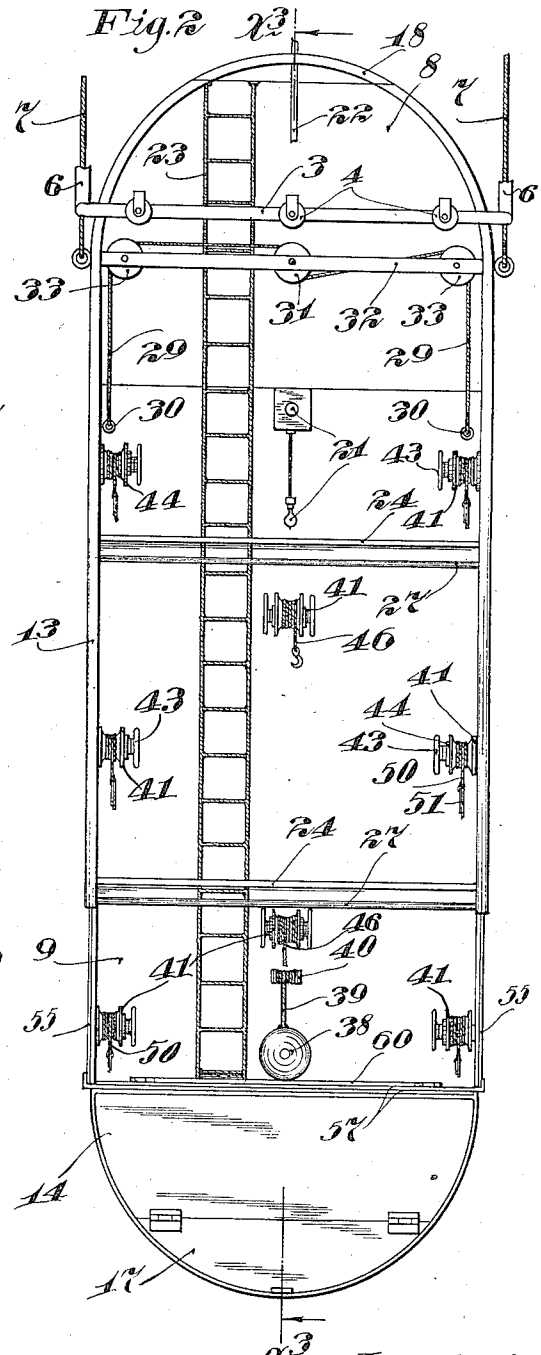


Fig. 2



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COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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3 SHEETS—SHEET 3.

Fig. 4

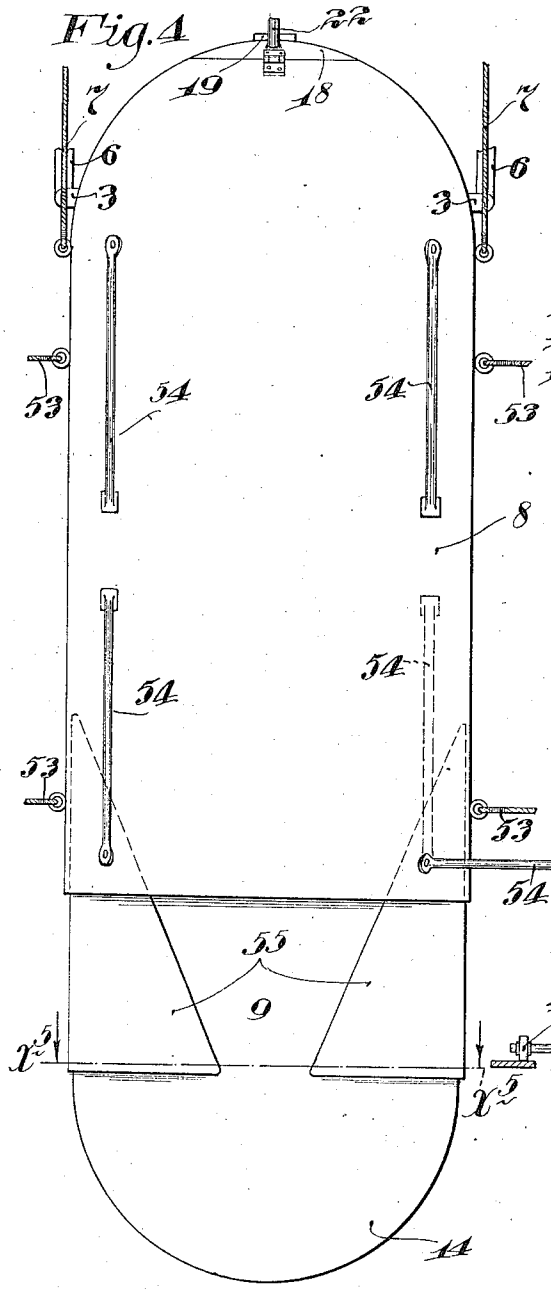


Fig. 7

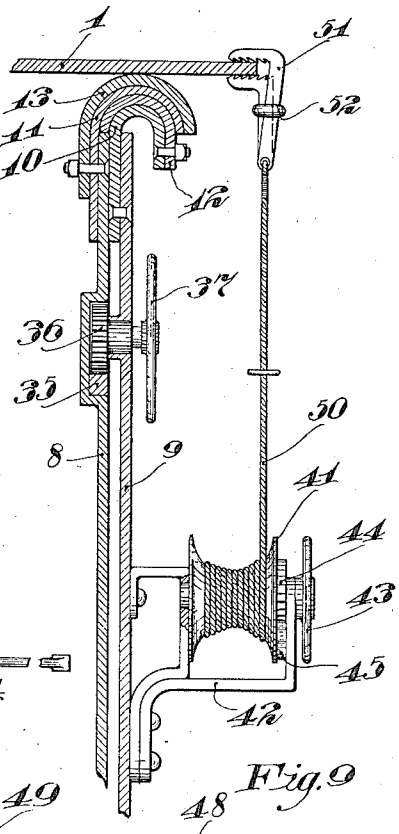
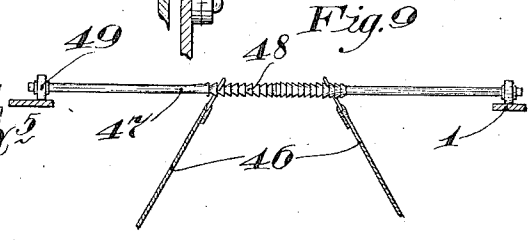


Fig. 9



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COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HERMAN FLÜGELTAUB, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO WILLIAM WEISMAN, OF MINNEAPOLIS, MINNESOTA.

DEVICE FOR STOPPING LEAKS IN BOATS.

1,060,177. Specification of Letters Patent. Patented Apr. 29, 1913.

Application filed September 18, 1912. Serial No. 720,961.

To all whom it may concern:

Be it known that I, HERMAN FLÜGELTAUB, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Devices for Stopping Leaks in Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a housing and equipment for repairing boat hulls.

The improved device has been especially designed to be carried on board a boat, as part of its equipment and where the same can be lowered, at any time, overboard to close a leak in the boat's hull which may have been caused by a collision with another boat, a rock or iceberg, or which boat hull may have been pierced by a projectile discharged from an enemy's gun.

In addition to stopping leaks in boat hulls, the improved device affords a suitable work house or casing in which a diver or divers may work, first in properly positioning the device to close the leak in the boat hull, and then to do the necessary work, on the outside of the boat hull, in repairing the same to close the leak therein.

To the above ends, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings: Figure 1 is a view of the improved device applied in working position to the outside of the hull of a boat; Fig. 2 is a front elevation of the improved device removed from the boat, on an enlarged scale; Fig. 3 is a longitudinal central section taken on the line x^3 x^3 of Fig. 2; Fig. 4 is a rear elevation of the improved device, as shown in Fig. 2; Fig. 5 is a transverse section taken on the line x^5 x^5 of Fig. 4, some parts being shown in different positions by means of dotted lines; Fig. 6 is a side view of the lower end of the improved device, some parts being shown in different positions by dotted lines; Fig. 7 is a detail view in transverse section, taken on the line x^7 x^7 of Fig. 3, with other parts added and some parts shown in different positions; Fig. 8 is an inside elevation of the parts shown in Fig. 7; Fig. 9 is a detail view of one method of anchoring the housing to the boat hull; and Fig. 10 is a view partly in side elevation and partly in vertical section, taken on the line x^{10} x^{10} of Fig. 1, showing the traveler which supports the housing.

The numeral 1 indicates, as an entirety, a boat which may be of any kind. Secured to the deck of the boat 1 is a track 2, having mounted thereon a traveler. The body 3 of this traveler has journaled thereto several alined wheels 4, arranged to run in tandem on the track 2. To each corner of the body 3 of the traveler is rigidly secured an upright or standard 6, having mounted in its upper end a guide sheave 5. This traveler may be anchored to the deck of the boat by a cable 6^a or any other suitable means.

Suspended from the traveler, by a pair of cables 7, is the improved housing and equipment used in stopping leaks in the hull of the boat and for repairing the same. These cables 7 are arranged to run over the sheaves 6 and may be operated by any suitable means, such as a windlass drum, not shown, for raising and lowering the housing in respect to the side of the boat. The improved housing comprises an upper shell section 8, and a lower shell section 9, the latter being slidably mounted on the former, as best shown in Fig. 3. For holding the two shell sections 8 and 9 interlocked for sliding movement one on the other, the marginal edge of the shell section 9 is provided with a channel piece 10 arranged to slidably work in a channel piece 11 on the marginal edge of the shell section 8. To form a water tight joint between the channel pieces 10 and 11 and the side of the boat, to which the work house is applied, a pliable packing strip 12 is secured to the outer face of the channel piece 10 and a pliable packing strip 13, is secured to the outer face of the channel piece 11. These packing strips 12 and 13 may be of rubber or of any other

suitable material. By reference to Fig. 7, it will be noted that the packing strip 12 extends between the channel pieces 10 and 11 at points where they are overlapped, thereby forming a water tight joint therebetween.

The lower end of the shell casing 9 terminates in a hopper bottom 14, adapted to hold a ballast 15 of sand or other suitable material. This hopper bottom 14 is separated from the rest of the casing 9 by a horizontally extended dividing plate 16. The lower inner portion of the hopper 14 is provided with a hinge door 17, affording access to the interior of the hopper 14. In the top of the casing 8 is a large hinged trap door 18, provided with a glass panel 19, for the purpose of admitting light to the interior of the work house. The door 18 is held closed by a spring latch 20.

In addition to the light admitted through the glass panel 19, the work house is artificially lighted with electric lights 21. The necessary electric current is supplied to these lights 21 through wires, not shown, leading from the boat's lighting system, or any other suitable source, and extending through a conduit 22 secured to the door 18 and extended above the water line. The necessary air conveying pipe, not shown, for the divers in the work house may also be extended through this conduit 22. Secured to the top of the casing 8, adjacent to the door 18, and extending to the bottom of the work house, is a rope ladder 23. To the side of the casing 9 are secured, as shown, two horizontally extended platforms or work benches 24, located one above the other and close to the open side of the casing 9. Obviously, either of these platforms 24 may be reached by means of the rope ladder 23. The platforms 24 are detachably secured to the casing 9 by eyes 25, permanently secured to the sides of said casing 9 and coöperating pins 26, insertible therethrough and secured to and depending from the four corners of the platform 24. Directly under each platform 24 is a brace or tie rod 27, terminating at its ends in hooks 28, connected to eyes 28^a, that are permanently secured to the side of the casing 9.

The casing 9 is suspended from the casing 8 by a pair of cables 29 having their lower ends secured to eyes 30 on the casing 9. The upper or other ends of the reversely extended cables 29 are wound on a winding drum 31. This winding drum 31 is secured between and to the intermediate portions of a pair of laterally spaced, horizontally extended bars 32, anchored at their ends to the sides of the casing 8. The intermediate portions of each cable 29 runs over a guide sheave 33, also secured between and journaled to bars 32. These guide sheaves 33 are located, one on each side of the winding drum 31 and directly above the eyes 30. For raising and lowering the casing 9, with respect to the casing 8, the winding drum 31 is provided with a hand wheel 34. In actual practice, the winding drum 31 will be held in different set positions by a pawl and ratchet, not shown. As an additional means for raising and lowering the casing 9, with respect to the casing, 8, a rack 35 and a coöperating pinion 36 are provided. The vertically extended rack 35 is rigidly secured to the casing 8 and the coöperating pinion 36 is rigidly secured to a hand wheel 37, the trunnion of which is journaled in the casing 9. In actual practice, this hand wheel will also be provided with a pawl and ratchet, not shown, and there will be a rack and pinion on each side of the casing 9.

For drawing the improved work house against the side of the hull of the boat, after the same has first been lowered into a position to close a leak in the boat hull, is provided a heavy weight in the form of a ball 38, secured to the casing 9 by a cable 39. When the ball 38 is not in use, its cable 39 is kept wound upon a windlass drum 40, secured to the intermediate portion of the casing 9. At the time the housing is lowered in front of the hole in the hull of the boat, one of the divers picks up the ball 38 and throws the same through the hole in the boat hull. If the cable 39 is too long to draw the housing against the side of the boat hull, the same may be wound onto the drum 40 by a hand crank, not shown, or by any other suitable means. Obviously, after the housing is in position against the hull of the boat, to stop the leak therein, and after the boat's pumps have removed the water, that has come in through the hole in the hull of the boat, to a sufficient extent to remove the water from the housing, the pressure of the water on the outside of the housing will hold the same tightly against the side of the hull of the boat.

To the side of the casing 9 is secured an upper, a lower, and an intermediate pair of windlass drums 41. Each windlass drum 41 is journaled in a bearing bracket 42, secured to the casing 9. The windlass drums 41 of each pair are axially alined and on the outer end of each of their trunnions is secured a large hand wheel 43. On each windlass drum 41 is rigidly secured a ratchet wheel 44 and on each bracket is a pivoted lock dog 45, that coöperates with the said ratchet wheel 44 to hold the windlass drum 41 in different set positions.

After the housing has been temporarily anchored by the ball weight 38, the same is further secured by a pair of transversely extended hook-equipped cables 46 wound, one on each of the intermediate windlass drums 41. The hook-equipped ends of the

cables 46 are anchored to the intermediate portions of a transversely extended rod 47 of such length as to span the hole in the boat hull, with its ends engaging the inner face of the hull of the boat, on opposite sides of the hole therein, as a base of resistance. As shown, in Fig. 9, the hooks of the cables 46 are held in different lateral adjustments, with respect to each other on the rod 47, by reversely extending ratchet-like projections 48, formed on the rod 47. On each end of the rod 47 is journaled an anti-friction roller 49. These rollers 49 permit the rod 47 to be more easily adjusted to bring the same into position to permit a direct pull on the cables 46. The final anchoring of the housing is accomplished by cables 50 wound, one upon each of the upper and lower pairs of drums 41. At the free end of each of these cables 50 is a pair of reversely acting tooth-equipped jaws 51, adapted to embrace the broken plates of the hull of the boat, as best shown in Fig. 7. For drawing the members of each pair of jaws 51 toward each other and clamping their teeth into opposite faces of the broken plate, a sliding ring or collar 52 is mounted on the shanks of the jaws 51.

To assist in moving the housing laterally in either direction along the side of the boat 1, pairs of long positioning cables 53 are secured at their lower ends to the casing 8 and their upper or free ends extend to the deck of the boat, and quite a distance from the traveler where they may be operated by the sailors. For guiding the housing along the side of the boat hull and for preventing the same from being caught and partly drawn into the hole in the hull of the boat at the time the housing is being lowered or positioned to cover said hole, long arms 54 are pivotally secured, at one of their ends, to the casing 8. As shown, there is an upper pair and a lower pair of these arms 54. When the housing is not in use, the arms 54 are turned into vertical or inoperative positions, but at the time the housing is being lowered or positioned to close a leak in the boat hull, the arms 54 are turned horizontally outward, as shown by full lines at the lower right hand corner of the casing 8, see Fig. 4. In case the housing is lowered into a position to cover only a portion of the hole in the boat hull, the arms 54 will span the hole and engage the side of the boat hull on the opposite side thereof, and thereby guide the housing while the same is being moved laterally to completely cover the said hole.

To make the housing further adjustable, so as to adapt the same to fit certain parts of the side of the boat hull, a pair of depending side plates or wings 55 are pivotally secured, at their upper ends, to the opposite side of the casing 9 by pivots 56. Transversely these plates 55 are bent to conform with the shape of the casing 9 and are slidably mounted thereon. To the lower inner corner of each of these side plates 55 is secured a segmental bottom or floor plate 57, that works on a pivot 58, secured to and projecting above the partition plate 16. Obviously, at the time the side plates 55 are moved into engagement with the sides of the boat hull, the floor plates 57 are also moved outward to partly close the open space between the outer edges of the partition plate 16 and the side of the boat. To fill the open space between the floor plates 57, when the same are moved outward, as shown in Fig. 5, and also to complete the closing of the lower open end of the casing 9, a hinged door section 60 is secured to the floor plates 57.

What I claim is:

1. A housing applicable to the outer face of the hull of a boat, to stop a leak therein, said housing being adjustable to cover more or less of the surface of said hull.

2. In a device of the kind described, the combination with a housing applicable to the outer face of the hull of a boat, to cover a hole or rent therein and form a water tight joint therearound, of means supporting said housing from said boat, in different vertical and horizontal positions with respect thereto, and means for drawing said housing against the hull of a boat under a varying pressure.

3. In a device of the kind described, the combination with a housing applicable to the outer face of the hull of a boat, to cover a hole or rent therein and form a water tight joint there-around, said housing being telescopically adjustable to cover more or less of the surface of said hull, of means supporting said housing from said boat, in different vertical and horizontal positions with respect thereto, and means for drawing said housing against the hull of a boat.

4. In a device of the kind described, the combination with an expansible and contractable housing applicable to the outer face of the hull of a boat, to cover a hole or rent therein and form a water tight joint there-around, of means supporting said housing from said boat, in different vertical and horizontal positions with respect thereto, a pliable packing forming a water tight joint between said housing and boat hull, and means carried by said housing, adapted to be anchored to the boat hull for drawing said housing onto said boat hull, under a varying pressure.

5. In a device of the kind described, the combination with a housing comprising an upper and lower casing, slidably mounted one upon the other, a traveler mounted on the deck of said boat, cables supporting the said upper casing in different vertical adjustments from said traveler, means supporting said lower casing from said upper

casing in different vertical adjustments, and means for drawing said housing against the hull of said boat under a varying pressure.

6. In a device of the kind described, the combination with a housing comprising an upper and lower casing, slidably mounted one upon the other, a traveler mounted on the deck of said boat, cables supporting the said upper casing in different vertical adjustments from said traveler, means supporting said lower casing from said upper casing in different vertical adjustments, and means for drawing said housing against the hull of said boat under a varying pressure, including windlass drums and cables.

7. In a device of the kind described, the combination with a housing comprising an upper and lower casing, slidably mounted one upon the other, a traveler mounted on the deck of said boat, cables supporting the said upper casing in different vertical adjustments from said traveler, means supporting said lower casing from said upper casing in different vertical adjustments, and means for drawing said housing against the hull of said boat, under a varying pressure, including windlass drums and cables, said cables having grapple jaws applicable to the broken sections of the boat hull.

8. In a device of the kind described, the combination with a housing affording a work house and applicable to the outer face of the hull of a boat, to cover a hole or rent therein, and form a water tight joint thereabout, of a traveler mounted on said boat for horizontal traveling movement, means supporting said housing from said traveler in different vertical adjustments, positioning cables extending in reverse directions from said housing to the said boat, and means for drawing said housing against the hull of said boat.

9. In a device of the kind described, the combination with a housing affording a work house and applicable to the outer face of the hull of a boat, to cover a hole or rent therein, and form a water tight joint thereabout, of means supporting said housing from said boat in different horizontal and vertical adjustments, guide arms secured to and capable of being projected laterally from the sides of said housing, and means for drawing said housing against the side of the hull of said boat.

10. A housing applicable to the outer face of the hull of a boat, to cover a hole or rent therein and form a water tight joint thereabout, said housing having side extension wings and floor extension plates.

11. A housing comprising telescopically connected sections, applicable to the outer face of the hull of a boat, to cover a hole or rent therein and form a water tight joint there-about, said housing having side extension wings and floor extension plates.

12. In a device of the kind described, the combination with a housing affording a work-house comprising telescopically connected sections applicable to the outer face of the hull of a boat, to cover a hole or rent therein, of means supporting said housing from said boat, in different vertical and horizontal positions with respect thereto, means for drawing said housing against the hull of a boat, an entrance door in said housing, work platforms in said housing, a ladder leading from said entrance door to the said work platform, and a lamp for lighting the interior of said work-house.

13. In a device of the kind described, the combination with a housing affording a work-house comprising telescopically connected sections applicable to the outer face of the hull of a boat, to cover a hole or rent therein, of means supporting said housing from said boat, in different vertical and horizontal positions with respect thereto, means for drawing said housing against the hull of a boat, an entrance door in said housing, work platforms in said housing, a ladder leading from said entrance door to the said work platforms, a lamp for lighting the interior of said work-house, and side extension wings and floor extension plates on said housing.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN FLÜGELTAUB.

Witnesses:
EDITH HANNA,
HARRY D. KILGORE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."