

(No Model.)

2 Sheets—Sheet 1.

R. P. C. SANDERSON.

COFFER DAM.

No. 259,218.

Patented June 6, 1882.

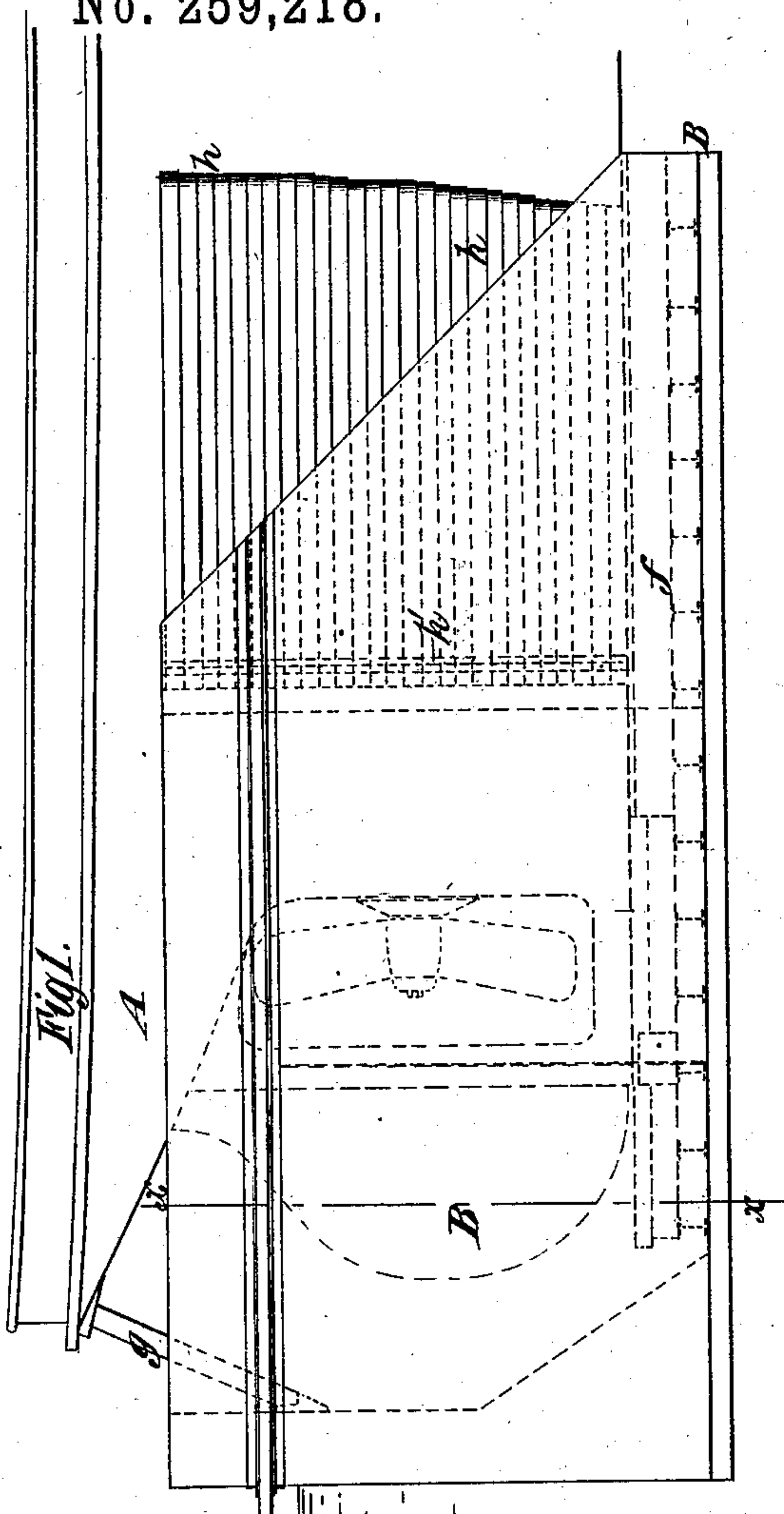
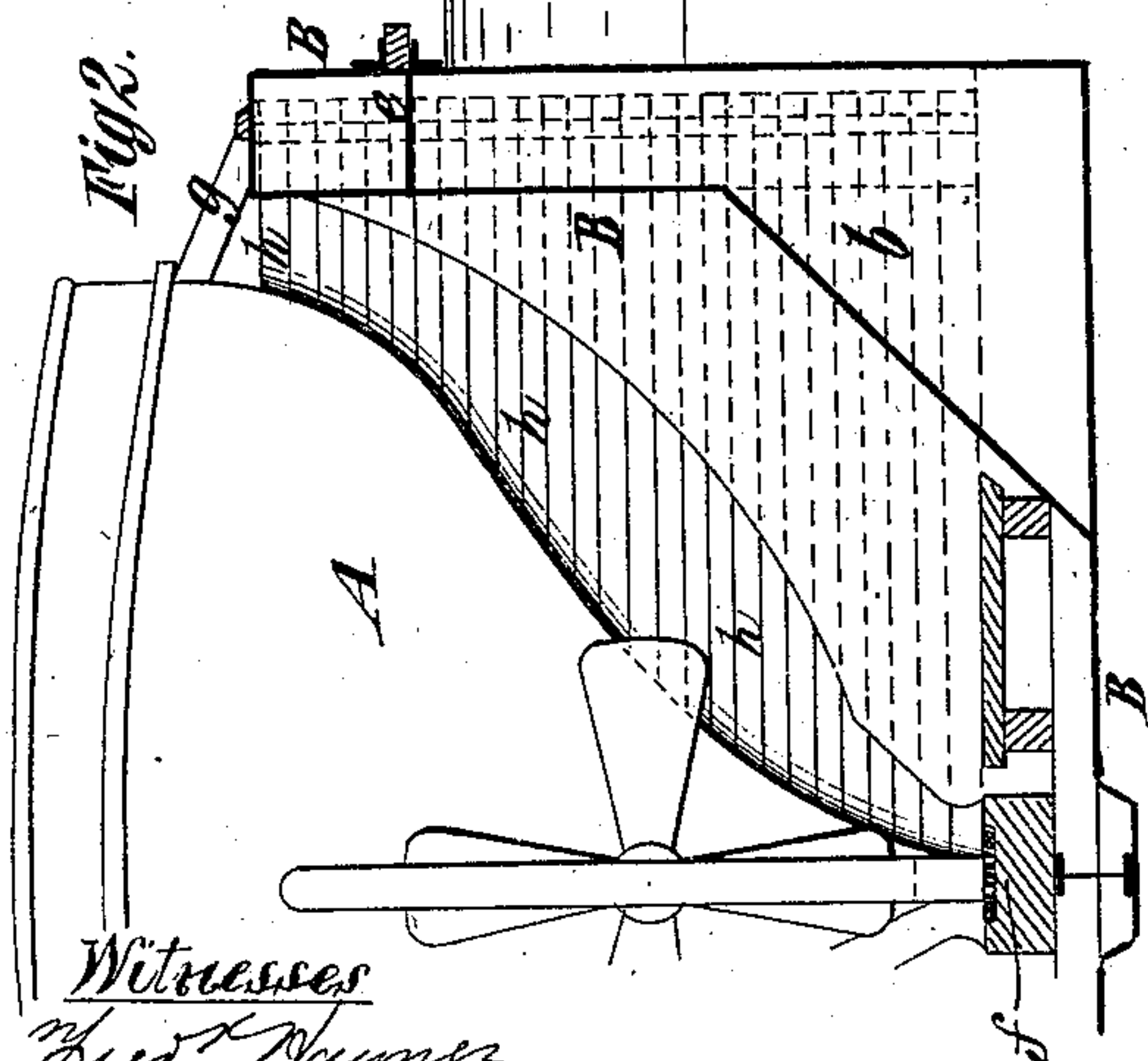
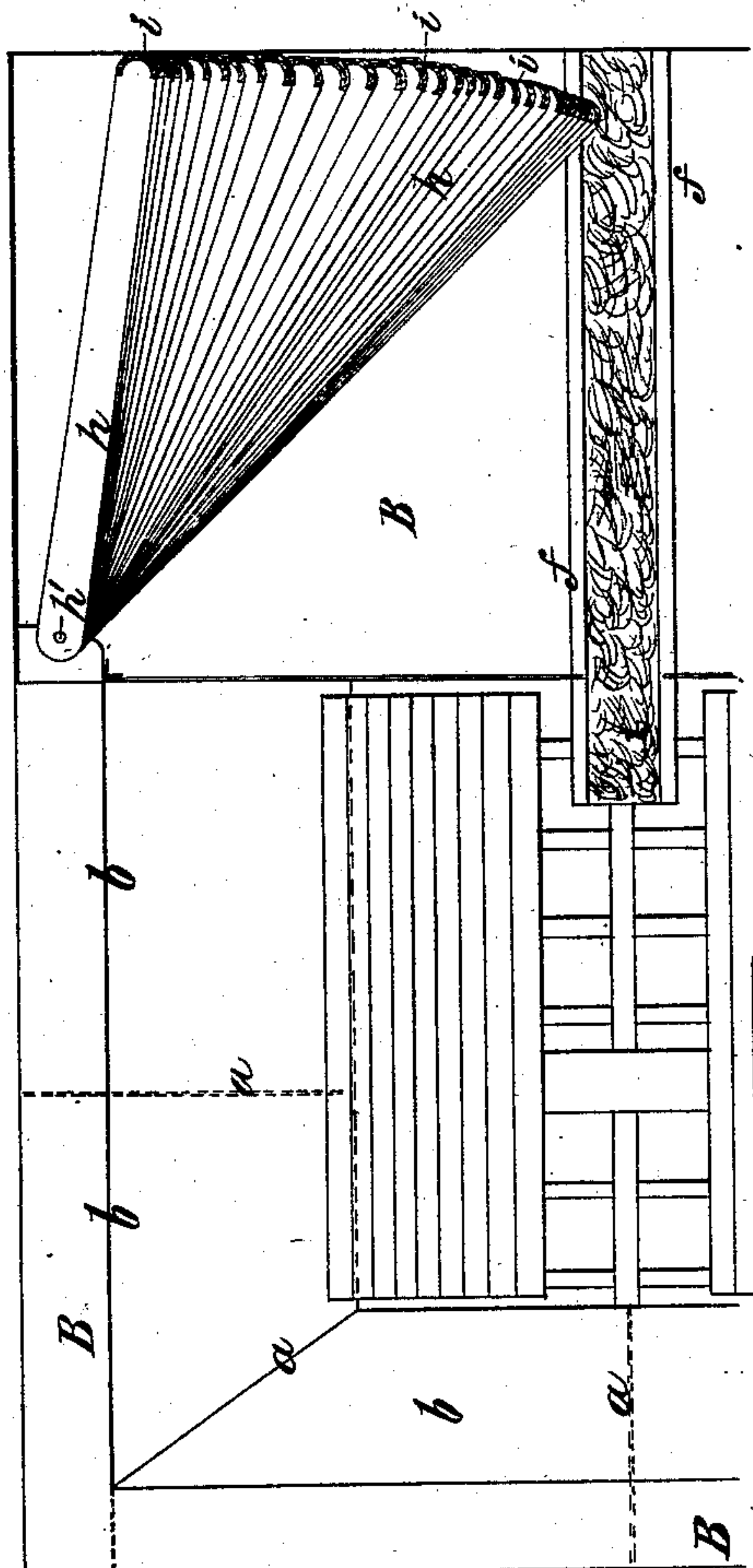


Fig. 3.



Witnesses  
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(No Model.)

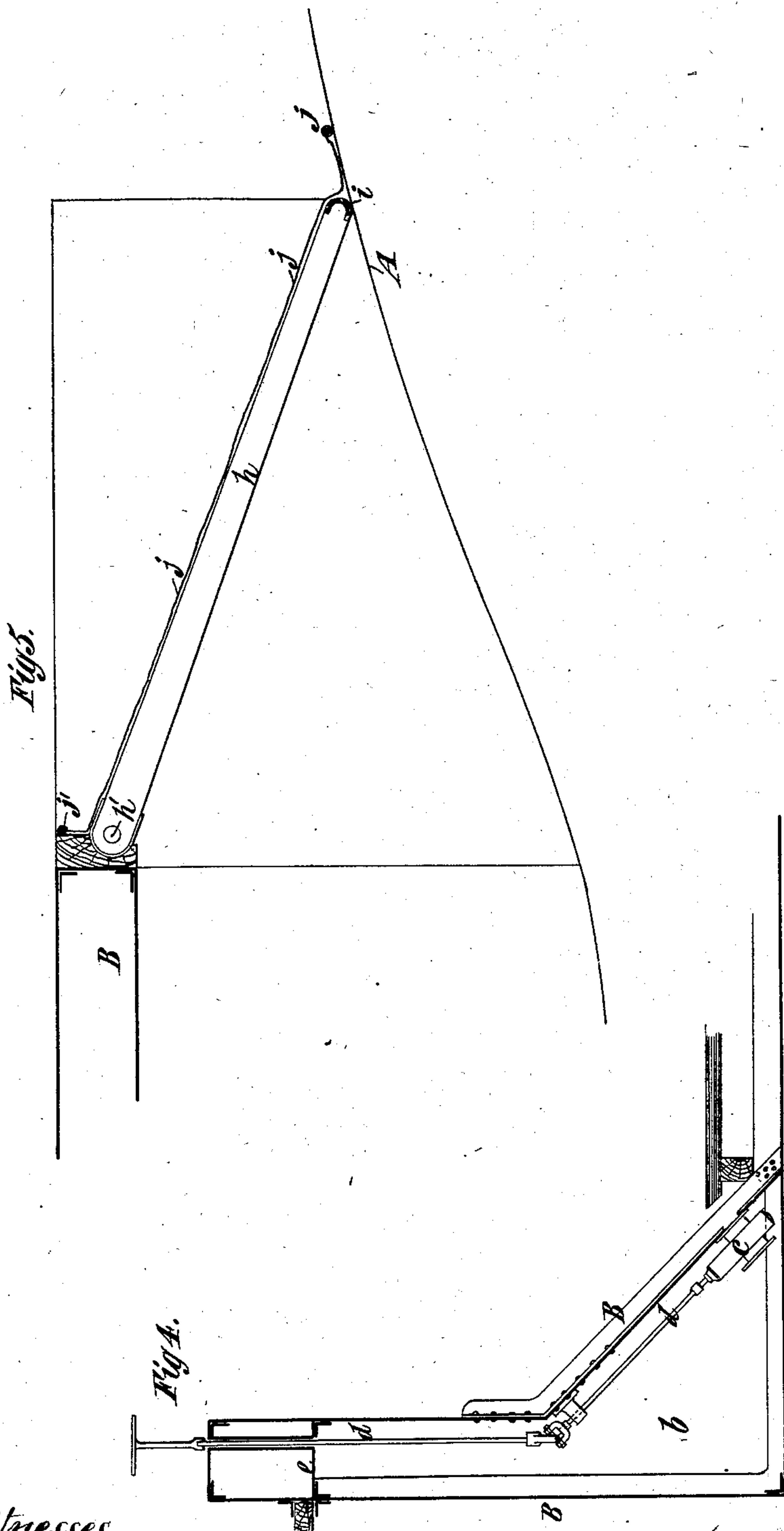
2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

RICHARD P. C. SANDERSON, OF NEW YORK, N. Y.

## COFFER-DAM.

SPECIFICATION forming part of Letters Patent No. 259,218, dated June 6, 1882.

Application filed February 4, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD PHILIP CHARLES SANDERSON, residing at the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Coffor-Dams, of which the following is a specification.

Steamships and other vessels, when their sterns, stern-posts, propellers, or rudders have required repairing or replacing, have commonly been compelled to go to dry-dock, marinerailway, or graving-dock to have this work done, and this necessitates the removal of all cargo, coal, and ballast to prevent the vessels from being strained, and entails frequent waiting until there is accommodation for them, and great expense and loss of time. To avoid these difficulties coffer-dams have been applied to the bows or stems of vessels; and my invention relates to coffer-dams of this class.

The object of my invention is to provide a coffer-dam which may be applied, without loss of time or any previous fitting, to the stem or stern of any vessel within certain limits, and which is so constructed that the space between the walls of the coffer-dam and the sides of the vessel may be more conveniently and effectively closed than in coffer-dams heretofore made.

The invention consists in the combination, with a coffer-dam adapted to receive the stem or stern of a vessel, of an upright series of arms or bars hinged at one end by an upright pivot or pivots and adapted to be swung horizontally on their pivot or pivots independently of each other to bring their outer or free ends against the side of the vessel. The aforesaid arms or bars may be of such a length that when adjusted against the sides of the vessel they will be diagonal or oblique to the length of the vessel, so that the pressure of the water upon them will press them upon and hold them firmly against the sides of the vessel, and thus more securely close the opening or space between the walls of the coffer-dam and the vessel.

The invention also consists in the combination, with a coffer-dam and the above-described arms or bars, of a rubber, canvas, or other suitable covering placed outside said arms or bars and adapted to be pressed tightly against them by the outside water when the

water is removed from the coffer-dam for the purpose of closing all openings and crevices between and adjacent to the adjustable arms or bars.

The invention also consists in the combination, with a coffer-dam comprising water-tight compartments, of the above-described adjustable arms or bars and valves for allowing the water in the coffer-dam to flow into said compartments, and thereby lowering the level of water in the coffer-dam so rapidly that the pressure of the outside water is quickly made available for holding the adjustable arms or bars tightly against the sides of the vessel, and thereby preventing leakage.

In the accompanying drawings, Figure 1 represents a side elevation of the stern portion of the hull of a vessel and my improved coffer-dam applied thereto. Fig. 2 represent a stern view of one vertical half of the vessel and a section of half of the coffer-dam on the line *xx*, Fig. 1. Fig. 3 represents a plan of one longitudinal half of the coffer-dam, showing the arms or bars as adjusted to fit the side of a vessel. Fig. 4 represents a vertical section of one side of the coffer-dam, upon a larger scale, illustrating a sluice-valve for controlling the flow of water from the inside of the coffer-dam to the water-tight compartments; and Fig. 5 represents a horizontal section of a portion of covering applied to the outer sides of the adjustable arms or bars and upon the same scale as Fig. 4.

Similar letters of reference designate corresponding parts in all the figures.

A designates the stern portion of a steamer or other vessel, and B designates the body of the coffer-dam, which is preferably constructed of plate-iron, strengthened with angle-iron and beams; but it may be made of other metal, or of wood, and of any desirable or suitable construction. It is here represented as made hollow at the sides and bottom, and such spaces are divided by bulk-heads *a* into water-tight compartments *b*. Each compartment is connected with the water outside the coffer-dam by a suitably-arranged valve or gate, and with the inside of the coffer-dam by a sluice-valve, *c*. (Shown clearly in Fig. 4.) Each compartment is also connected with the suction-pipe of the pumps by suitable pipes and valves, and the pumps are preferably arranged on an attend-



ant boat, to render the coffer-dam less unwieldy, but might be arranged on the coffer-dam itself.

All the valves or sluices are provided with means for operating them from the top of the coffer-dam—as, for instance, the valve *c* in Fig. 4, which may be operated through coupled rods *d* by a hand-wheel or handle on top of the coffer-dam.

Near the top of the coffer-dam is a horizontal bulk-head, *e*, which forms above it an air-compartment, which has sufficient buoyancy to prevent the coffer dam from sinking altogether if the attendant should leave the valves for admitting water from the outside into the compartments open too long, or in case of any other accident. When the coffer-dam is to be used the valves are opened to admit water from the outside into the compartments, and the coffer-dam is sunk low enough to permit the vessel to pass into it. The valves are then closed and the coffer-dam is drawn or pushed under and around the end of the vessel into proper position. The water is then pumped out of the compartments *b*, and the dam will rise by buoyancy until the keel of the vessel rests firmly upon the wooden-padded keelson *f*, as shown in Fig. 2, whereupon the dam is shoved up at the ends and sides, as shown at *g*, and while all is being made secure and fast all the water is pumped out of the compartments.

At the front end of each side of the coffer-dam is an upright series of arms or bars, *h*, which are all pivoted or hinged by an upright pivot or pintle, *h'*, and are adapted to swing horizontally independently of each other. These arms or bars are in close contact with each other, and they are adapted to be swung inward, so that the end of each arm will bear snugly against the part of the skin of the vessel opposite to it, and the ends of these arms may be padded, as shown at *i* in Figs. 3 and 5, to enable them to have a close contact with the vessel.

The arms or bars may be swung inward by ropes, chains, or other suitable devices, and when adjusted snugly against the skin of the vessel they form a wall extending from the keel of the vessel to above the water-line.

The arms or bars *h* are here represented as of such length that when swung against the vessel they will project outward from the coffer-dam and diagonally or obliquely to the length of the vessel, so that the inward pressure of the water upon their outer sides will hold them securely against the side of the vessel, and thus render them more effective in preventing leakage. When the arms or bars *h* are all properly brought to bear against the vessel the sluice-valves *c*, which afford communication between the inside of the coffer-dam and the now empty compartments *b*, are all quickly opened, and the water will flow rapidly from the inside of the dam into the compartments until it attains an equal level, the compartments being provided with air-vents to permit the water to flow in. By this means

a difference in the height of the water inside and outside the coffer-dam is produced, and the external pressure on the arms *h* will press them all strongly against the vessel.

To prevent leakage I apply to the outside of the arms or bars *h* a covering, *j*, of rubber, canvas, tarpaulin, or other suitable material, which, by the external pressure, will be pressed tightly against and into all the crevices between or adjacent to said arms or bars, and will thus render the dam practically watertight. The water is then pumped out from the compartments and the vessel is ready for the workmen to begin operations upon it.

The covering *j* may be nailed to the bars or arms *h* in strips; or it may consist of a sheet, as shown in Fig. 5, having one edge, *j'*, fastened to a rope outside and adjacent to the hinges of the arms or bars *h*, and the opposite edge fastened to a rope, *j''*, which may be passed around the vessel.

By my invention I provide for making a coffer-dam which need not be expressly fitted to the vessel to which it is to be applied, but which may be quickly applied to any vessel within certain limits of measurement.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a coffer-dam adapted to receive the stem or stern of a vessel, of an upright series of arms or bars hinged at one end to the coffer-dam by an upright pivot or pivots, and adapted to be swung horizontally on their pivot or pivots independently of each other to bring their opposite ends against the side of the vessel, substantially as specified.

2. The combination, with the coffer-dam B, of two series of arms or bars, *h*, hinged at their outer ends to the sides of the coffer-dam, and adapted to swing horizontally independently of each other, the said arms or bars being of such length that when swung inward against the sides of a vessel they will be diagonal or oblique to the length of the vessel, substantially as and for the purpose specified.

3. The combination, with a coffer-dam adapted to receive the stem or stern of a vessel, of an upright series of separately-adjustable arms or bars arranged at each side of the coffer-dam, and adapted to have their ends brought against the sides of a vessel, and a covering of canvas, rubber, or other material applied to the outer sides of said arms or bars, substantially as and for the purpose specified.

4. The combination, with a coffer-dam comprising water-tight compartments and provided at each side with an upright series of separately-adjustable arms or bars, of valves for allowing water to flow from the inside of the coffer-dam into said compartments, substantially as and for the purpose specified.

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Witnesses:

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