

(No Model.)

D. W. HOWES.

COFFER DAM.

No. 326,985.

Patented Sept. 29, 1885.

Fig. 1.

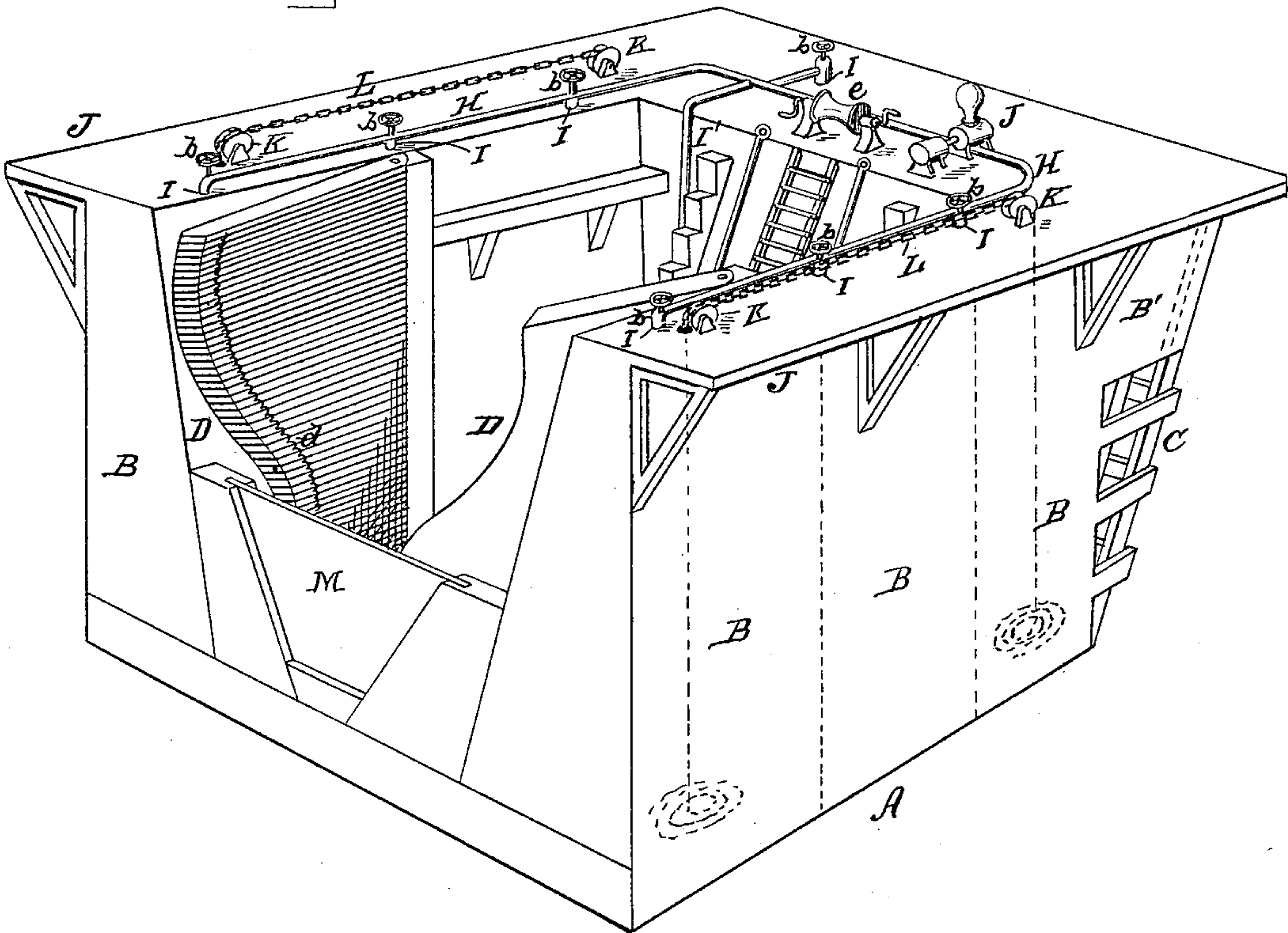


Fig. 2.

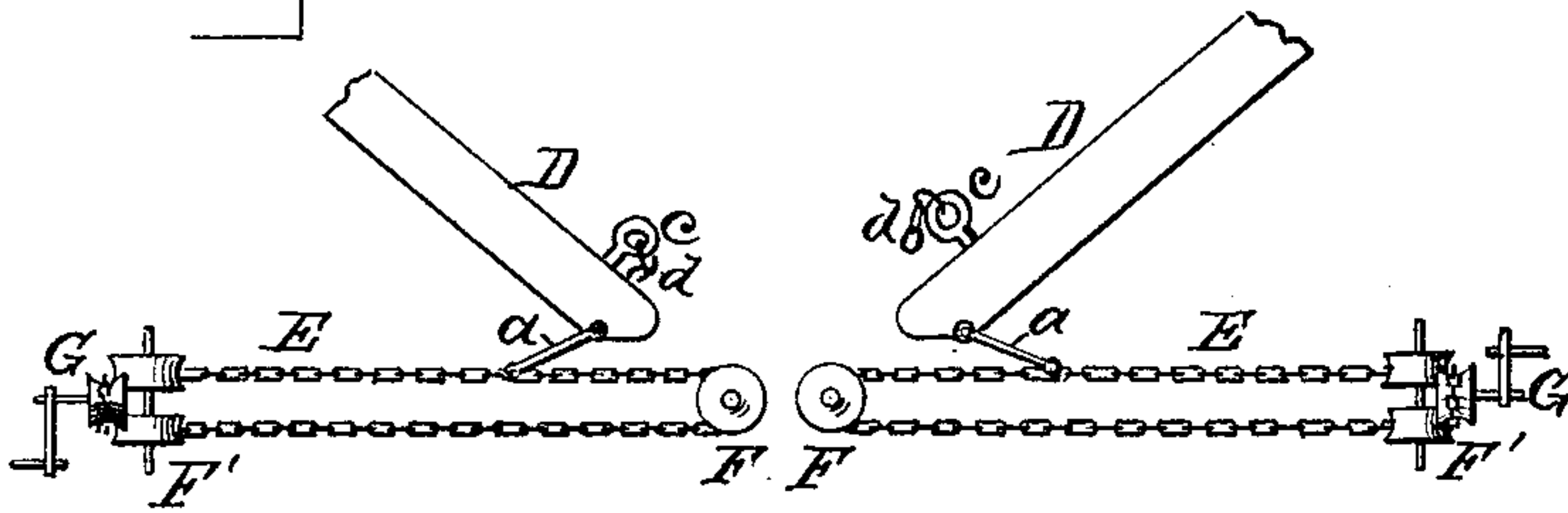
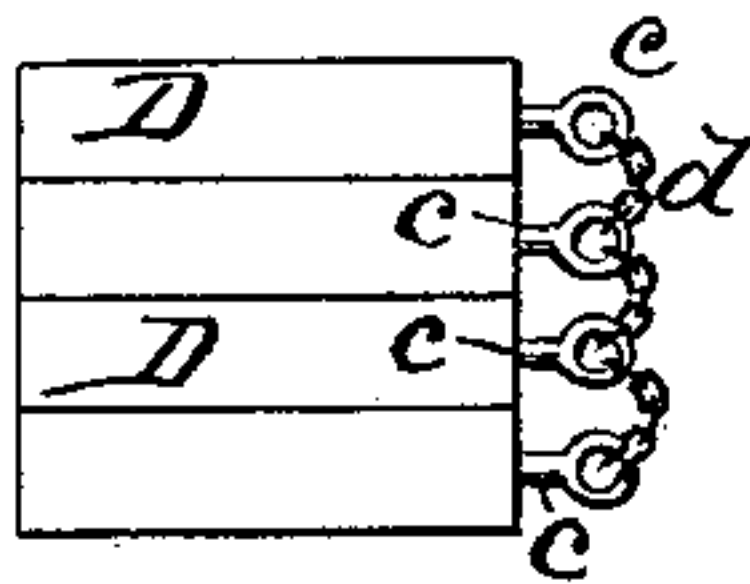


Fig. 3.

WITNESSES:

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COFFER-DAM.

SPECIFICATION forming part of Letters Patent No. 326,985, dated September 29, 1885.

Application filed November 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, D. WILLIS HOWES, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful
5 Improvement in Coffor-Dams, of which the following is a specification, reference being had to the annexed drawings, in which—

Figure 1 is a perspective view of a coffer-dam embodying my improvement, and Figs.
10 2 and 3 are detail views of the mechanism for closing the arms upon the keel of the vessel.

My present invention is an improvement upon the coffer-dam patented by R. P. C. Sanderson, June 6, 1882, No. 259,218, and is
15 designed to render the coffer-dam described in that patent more efficient and more readily managed.

The coffer-dam described in Patent No. 259,218 is designed to be applied to the stem
20 or stern of a vessel without loss of time or any previous fitting, and is so constructed that the space between the walls of the coffer-dam and the sides of the vessel may be conveniently and effectively closed. The essential feature
25 of that invention is an upright series of arms or bars, hinged at one end by an upright pivot, and adapted to be swung horizontally independent of each other, to bring their outer or free ends against the sides of the vessel, the
30 arms or bars being provided with a covering of rubber, canvas, or other suitable material for excluding the water from the interior of the coffer-dam.

My improvement is designed to facilitate the
35 closing of the pivoted arms against the sides of the vessel; to more readily trim the coffer-dam, to bring it into a state of stable equilibrium, and to protect the pivoted arms against injury from contact with objects floating in
40 the water.

It also further consists in an auxiliary device for trimming the coffer dam, composed of two sets of chains—one on either side—adapted to be hauled over sheaves, so as to increase
45 the weight at the bow or stern of the coffer-dam, as may be found necessary.

The body A of the coffer-dam, which is made of iron or steel or wood, according to any of the well-known methods, is provided with
50 series of water-tight compartments B along the sides and bottom thereof, and to the stern

is secured an auxiliary compartment, B', which is supported near the top of the coffer-dam upon timbers C, which extend obliquely from the bottom of the coffer-dam to the top of the auxiliary compartment B', and are braced by
55 some of the plank forming the sides of the coffer-dam, which extend to the timbers C, and are connected with similar plank extending across the timbers C at the rear end of the
60 coffer-dam. The front end of the coffer-dam is open, and in the side of the coffer-dam is pivoted an upright series of arms, D, the pivot of the arms being removed from the open end of the coffer-dam a distance equal to the length
65 of the said arms, or thereabout. The axial line of the pivots of the arms D is inclined toward the rear of the coffer-dam, to insure the better adaptation of the ends of the arms to the sides of the vessel.
70

The arms D are arranged to swing horizontally independently, but in close contact with each other. They are adapted to be swung inward, so that the free end of each arm will bear against a part of the skin of the
75 vessel opposite to it, when the coffer-dam has been placed in position for use at the bow or stern of the vessel in the manner presently to be described.

To prevent leakage, a covering of rubber,
80 canvas, or other suitable material is applied to the exterior of the series of arms, and is made by external water-pressure to conform to the curved wall formed by the arms.

In Patent No. 259,218 the coffer-dam terminates at a point near the pivot of the arms D. In my invention I have prolonged the sides and bottom of the coffer-dam to afford an efficient protection to the arms D, and also to add to the buoyancy and stability of the
85 coffer-dam when in use. To the lower arms of each series D, I have attached connecting-rods a, which are secured to chains E, running over sheaves F F' in the bottom of the coffer-dam, thence over suitable guiding-sheaves to
90 a windlass, G, at the top, by means of which the chain may be revolved so as to draw the lower arms together or separate them, according to the requirements of use, the connecting-rods a serving to push the arms forward be-
100 yond the sheaves F.

To the inner edge of each arm D, I secure an

eye, *c*, and to each series of eyes *c*, I secure a chain, *d*, loosely, to admit of a certain amount of independent motion to each arm. When it is desired to draw the arms *D* together against the sides of a vessel, I attach cords or chains to the chains *d* and connect them with a windlass, *e*, carried by the coffer-dam at the rear end.

On the top of the coffer-dam, above each series of compartments *B*, and along the stern, I arrange a pipe, *H*, which is provided with branch pipes *I*, extending down into the several compartments, each provided with a valve, *b*, by means of which the pipe *I* may be opened or closed, and thus put into communication with a pump, *J*, mounted upon the coffer-dam or upon a boat accompanying it, and having its suction connected with the pipe *H*. I also provide a branch suction-pipe, *I'*, which extends down into the main compartment of the coffer-dam. By means of this arrangement water may be removed from any one of the compartments *B B'*, or from the main compartment in which the vessel is received, or from all of the said compartments simultaneously, thus permitting of rendering either the bow or the stern of the coffer-dam more or less buoyant, as may be required, in order to bring the bottom of the coffer-dam into contact with the keel of the vessel.

To still further assist in the trimming of the coffer-dam and bringing it to a proper bearing on the keel of the vessel, I have placed along each side thereof a series of sheaves, *K*, over which I pass a heavy chain, *L*, which may be hauled from front to the rear or from the rear to the front of the coffer-dam, and allowed to pile itself up in either of the compartments into which it falls from the sheaves, to increase the weight at the front or rear, and thus trim the coffer-dam and insure its bearing properly upon the keel of the vessel to which it is applied.

To the front of the coffer-dam I apply a gate, *M*, for convenience in transportation, and for excluding the floating material that might otherwise enter the coffer-dam and interfere with the operations of arms *B* and of the valves and pumping mechanism.

When the coffer-dam is to be used, 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 pushed under and around the end of the vessel into the required position. The water is then pumped out of the compartments *B*, when the dam will rise by its buoyancy until the keel of the vessel rests firmly upon the bottom of the coffer-dam, when the arms *D* are closed in against the sides of the vessel in the manner already described, and enough of the water remaining in the compartments *B B'* and *B'* is pumped

out to insure the proper bearing of the coffer-dam on the keel of the vessel. The chains *L* are also brought into use for this purpose. After the coffer-dam has been properly adjusted the pivoted arms *D* are closed in upon the sides of the vessel in the manner already described, when the water is pumped from the interior of the coffer-dam, and the arms *D* will be held in their place against the side of the vessel by external water-pressure.

To afford additional deck-room for convenience in operating the coffer-dam, I have provided on either side of the coffer-dam a deck-extension, *J*, supported on brackets or knees secured to the outer walls of the coffer-dam; and to hold the coffer-dam securely in place I provide rods or chains and turn-buckles, the rods or chains being attached to the sides of the coffer-dam and fastened to the top of the vessel. I have not deemed it necessary to represent in my drawings this method of securing the coffer-dam, as it is only one of several obvious methods of doing the same thing.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a coffer-dam employing series of pivoted arms *D*, capable of being adapted to the sides of the vessel, as described, the prolongation of the body of the coffer-dam beyond the pivots of the said arms *D*, inclosing the entire outer side of each series of arms, substantially as and for the purpose herein specified.

2. In a coffer-dam provided with series of pivoted arms *D*, to adapt it to the sides of the vessel to which it is applied, the combination, with the said arms *D*, of connecting-rods *a*, secured to the lower arms of the series, chains connected with the connecting-rods *a*, and mechanism for operating the chains, substantially as herein described.

3. In a coffer-dam provided with series of arms *D*, to adapt it to the sides of a vessel, as described, the combination, with the said arms *D*, of eyes *c*, and chains *d* connected therewith, to hold the arms *D* in proper relation to each other and to receive ropes by which the said arms are drawn against the sides of the vessel, as herein described.

4. The combination, with a coffer-dam having water-tight compartments *B* and *B'*, of pipes *H I I'*, and valves for controlling the removal of the water from the said compartments, as herein specified.

5. The combination, with a coffer-dam having water-tight compartments *B*, as described, of sheaves *K*, and chains *L* running over the sheaves *K*, to trim the coffer-dam, as herein described.

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Witnesses:

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