(No Model.)

2 Sheets—Sheet 1.

H. P. KIRKHAM.

COFFER DAM.

No. 253,067. Patented Jan. 31, 1882.

Fig: 1.

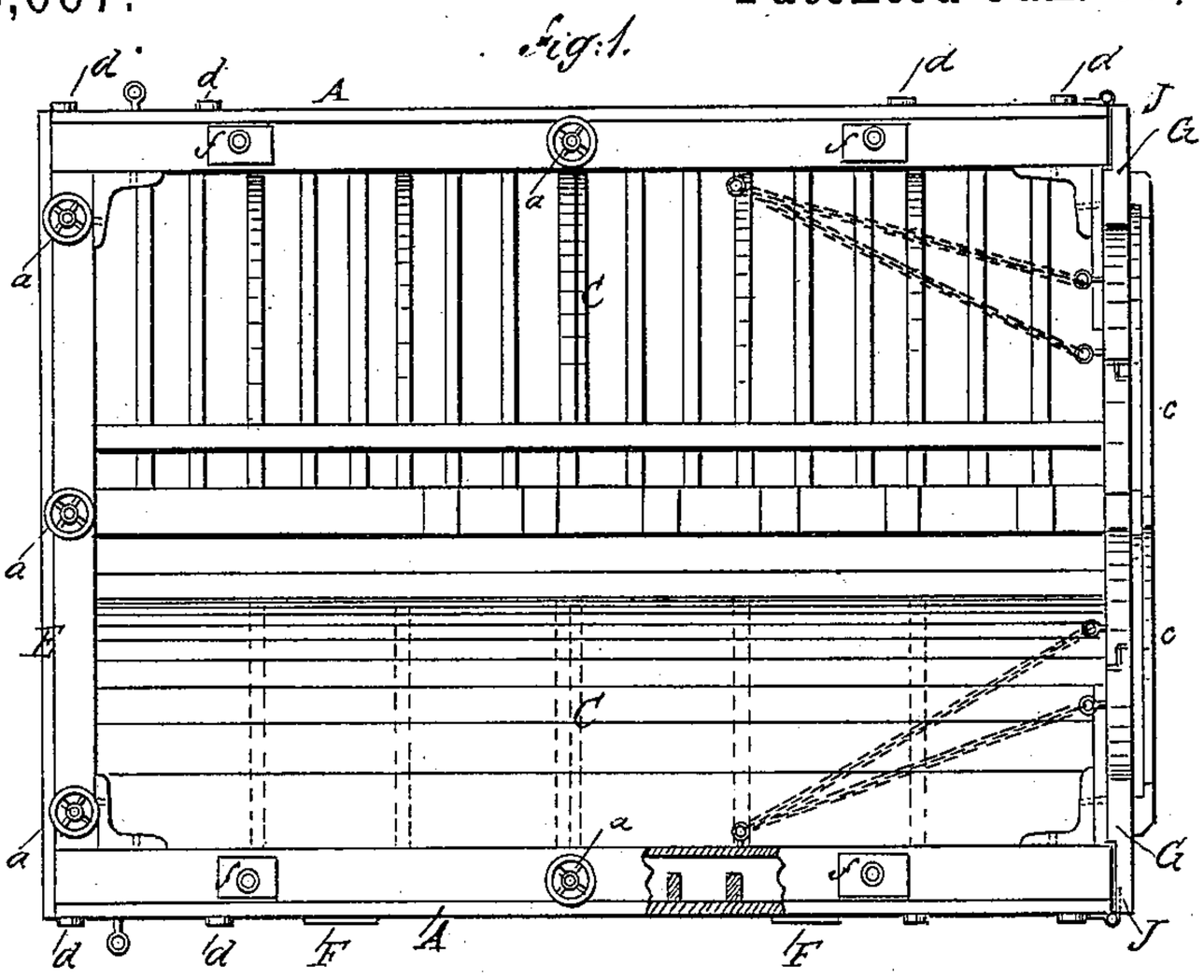


Fig: 2.

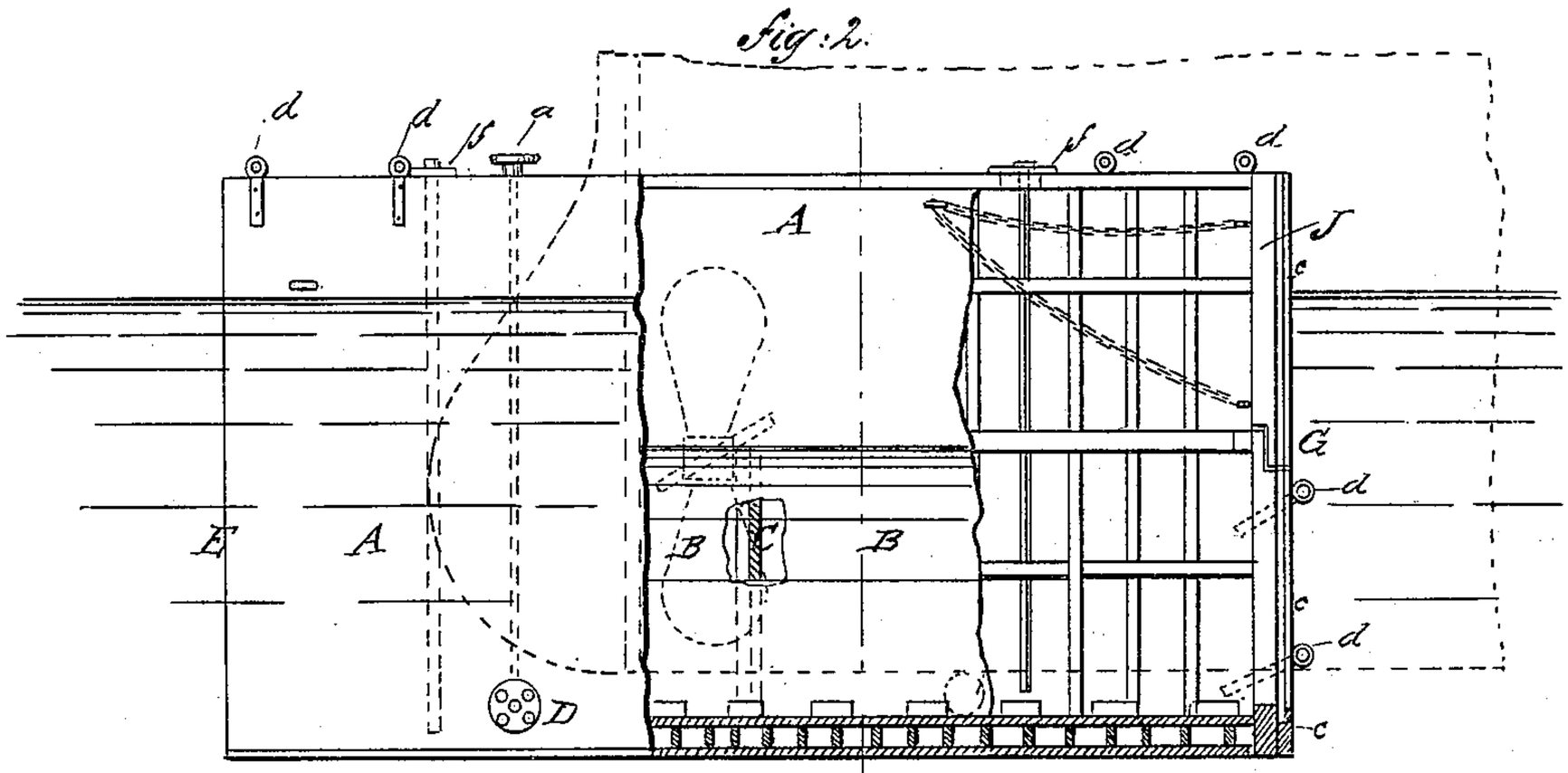
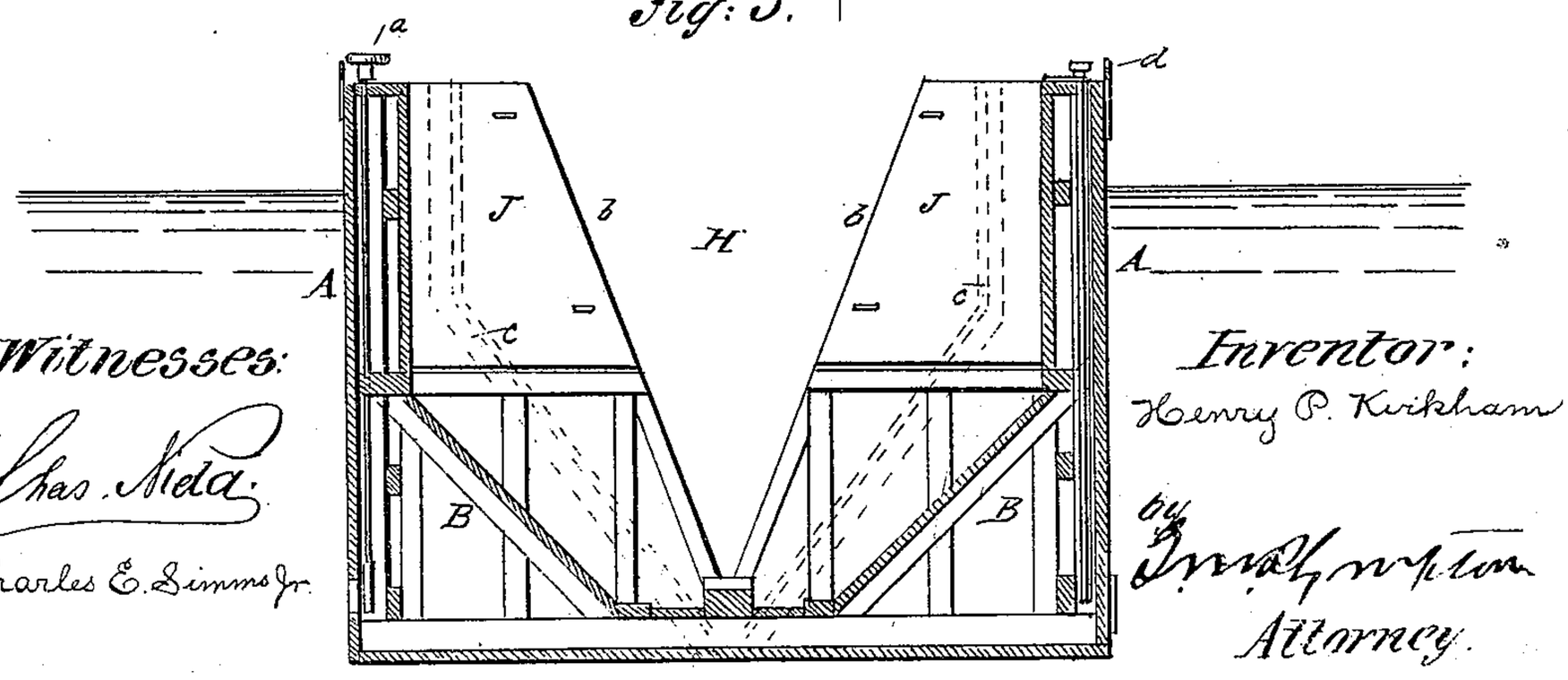


Fig: 3.



Witnesses:

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Attorney.

(No Model.) 2 Sheets—Sheet 2.

H. P. KIRKHAM.

COFFER DAM.

No. 253,067. Patented Jan. 31, 1882.

Fig. 4.

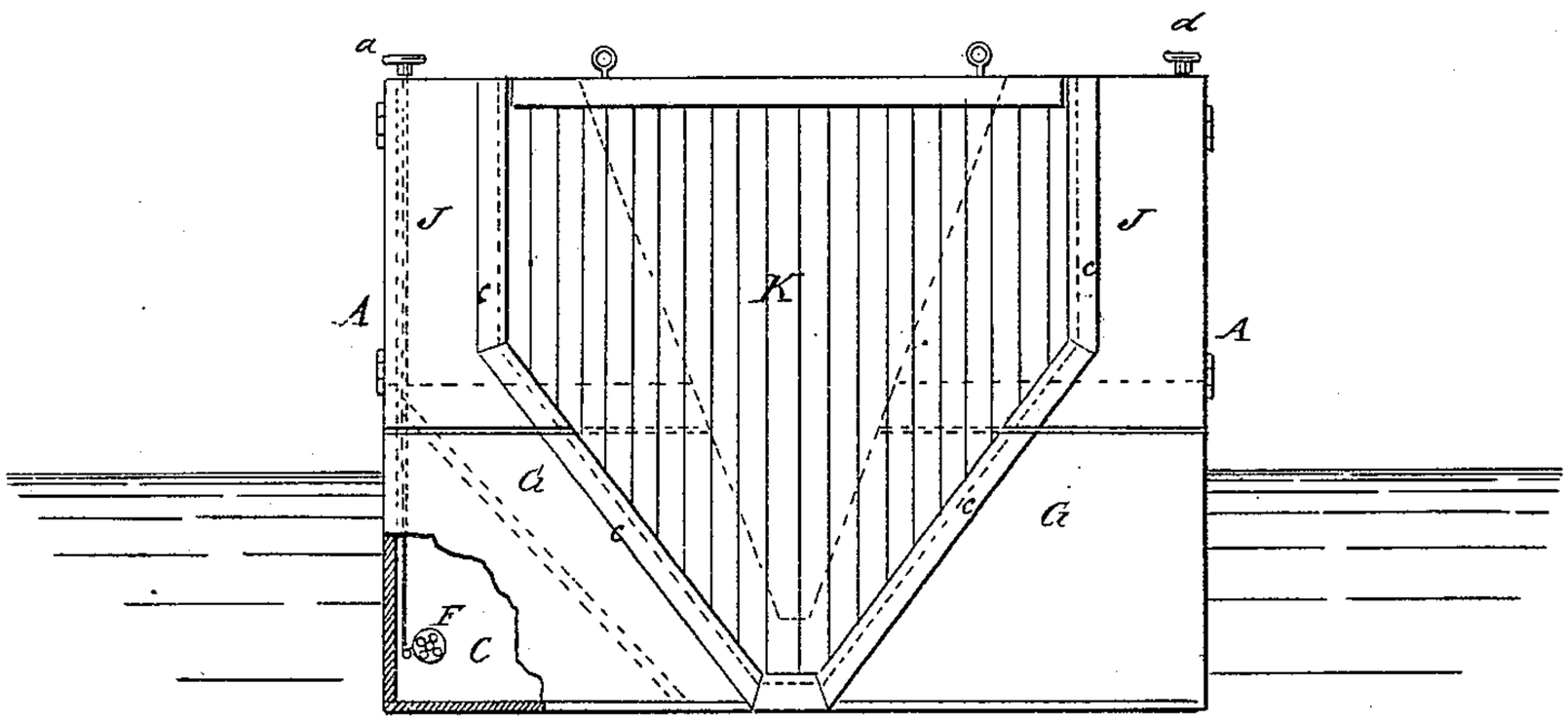
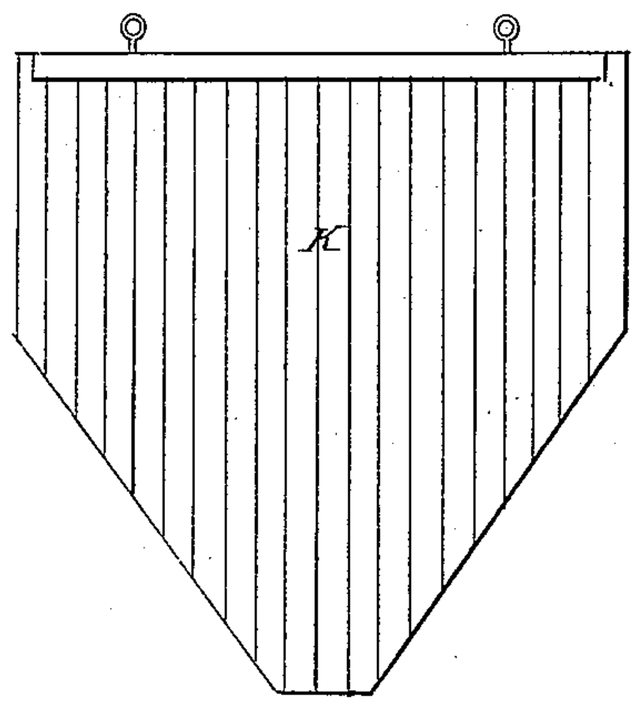


Fig: 5.



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UNITED STATES PATENT OFFICE.

HENRY P. KIRKHAM, OF BROOKLYN, NEW YORK.

COFFER-DAM.

SPECIFICATION forming part of Letters Patent No. 253,067, dated January 31, 1882.

Application filed November 30, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. KIRKHAM, of Brooklyn, Kings county, and State of New York, have invented a new and Improved Coffer-Dam; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

This invention is in the nature of an improvement in coffer-dams, to be used in repairing ships and other sea-going vessels; and the invention consists in a coffer-dam provided with swinging gates, and a sliding gate at one end, all constructed and arranged in the manner hereinafter more particularly described and shown.

In the accompanying sheet of drawings, Figure 1 represents a plan or top view of my dam; Fig. 2, a side view, partly in section; Fig. 3, a cross-section; Fig. 4, a front end view, showing sliding gate in position; Fig. 5, an elevation of sliding gate.

This invention relates more particularly to that class of coffer-dams that are employed to surround certain parts of a vessel's hull that is below the surface of the water, whereby the water may be excluded and necessary repairs made.

Heretofore coffer-dams of this description have been balanced by means of heavy chains or other ballasting material. The difficulty of evenly balancing the coffer-dam by this means frequently brought unequal strain upon the shores used to steady the dam and ship, resulting in injury to both the shores and dam, tending to disarrange the relative position of the dam and ship, and seriously interfering with the proper accomplishment of the repairs, besides causing much delay and consequent loss of time.

Another difficulty arising from the use of the coffer-dams as they are ordinarily constructed is that when it is necessary to repair the stern, stern-frame, or propeller of a steam-vessel, the dam must be almost wholly submerged in order to permit the propeller to pass over its upper edge and so into the dam. This takes time both in the submerging and the subsequent pumping out of the dam.

To obviate these objections, and to construct a coffer-dam in other respects better adapted to the purposes for which it is designed, I construct my dam, which may be of any convenient length, breadth, and depth, with its bottom, two sides, and one end tightly united and closed so as to be water-tight, their construction being at the same time strong and compact. Within the dam, on each side of the same and sloping inward from about half the height of the sides A thereof, are constructed compartments or water-tanks B. These tanks extend the entire length of the dam, and midway of their length they are each divided by a water-tight partition, C, the tanks themselves being also water-tight in every particular.

Through the outer side of each side A are openings covered by inlet-vales D, which may slide or be otherwise made to operate in any convenient way. Similar openings and valves are placed on the outer side of the end E. All of these valves are manipulated by means of a wheel, *a*, or a lever. In the water-tight partitions C are also openings, which openings are also closed by a valve, F, similar in construction and operation to valves D, before described.

The end G of the dam is provided with an opening, H, having conical sides *b*, which sides are packed with canvas and felt. The upper portion of these sides at the end G is divided into hinged doors J, which open outward; also, to the end G and the doors J, and on the outer surface of the same, are fixed rabbeted battens *c*, into which fits a sliding gate, K, to completely close, when in place, the opening H, and to retain the doors J in a closed position.

To the coffer-dam, at convenient locations, are secured eye-straps *d*, by means of which and suitable rods and turn-buckles the dam may be secured closely in position against the ship needing repairs.

Now my coffer-dam, when constructed substantially as above described, is operated by towing it to the vessel, and when in position the gate K is removed, and if the stern of the vessel is to be repaired the doors J are swung open, the valves D are opened, permitting the water to freely enter within the dam, until it sinks sufficiently to be hauled under the keel of the vessel, the open doors J allowing the propeller to enter freely, and thereby avoid the almost complete submersion of the dam. To insure the

level sinking of the dam either one of the valves F may be opened, which will admit through the water-tight compartments more or less water in such compartments, as the position of the dam may require, in this way balancing the dam and keeping it in perfect trim, and preventing its listing from one side or the other, or from its ends. When in this way the dam has been properly submerged the valves D and F are closed, and one or more hose inserted through the hose-holes *f*, when, by means of a pump on a tug alongside or otherwise, the water is removed from the interior of the dam and from the tanks B, causing the dam to rise under the vessel, to which it is tightly drawn and held in place by means of rods hooked into the eye-straps *d*, and turn-buckles fixed thereon, by means of which the dam is drawn tightly and is rigidly held to the bottom of the ship, the packing in the sides or edges *b* of the opening H effectually keeping out the water. Access is then safely and conveniently had to the ship's bottom and the necessary repairs made. When the work is done the guy-rods are loosened and removed, and the dam is again submerged, as before, and drawn from beneath the vessel, the doors J closed and the gate K put in position to close the opening H, the water again pumped out to a certain extent, and the dam safely towed away.

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

1. A coffer-dam with a conical opening at one end provided with hinged doors, substantially in the manner shown and described.

2. In a coffer-dam provided with an opening at one end having folding doors, a removable sliding gate, whereby the opening in the end of the dam may be closed and the hinged doors kept closed, substantially as is shown and described.

HENRY P. KIRKHAM.

Witnesses:

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