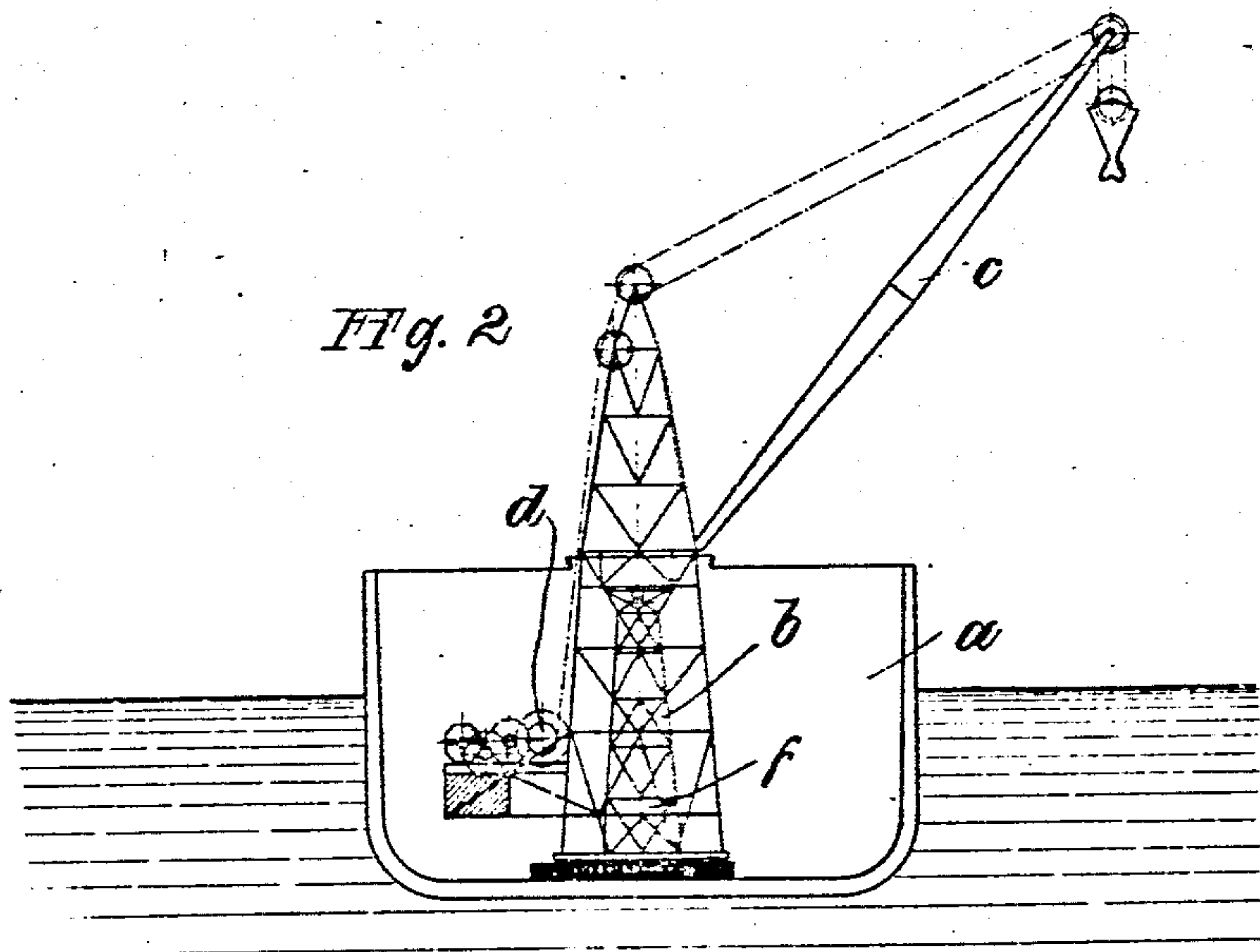
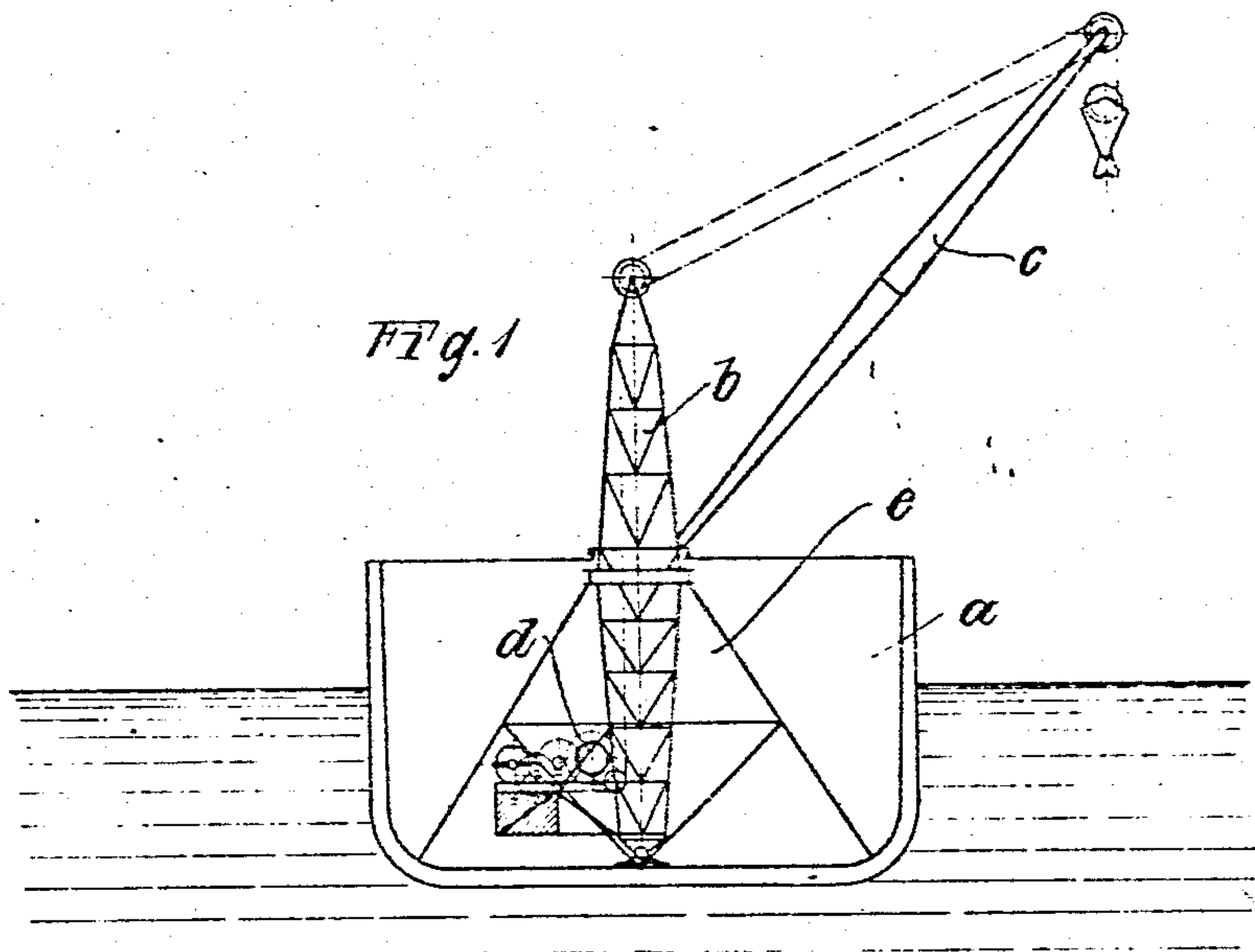


948,304.

A. BODE.
FLOATING CRANE.
APPLICATION FILED AUG. 26, 1909.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1.



Witnesses:
Paul Hermann.
Carl Lamm.

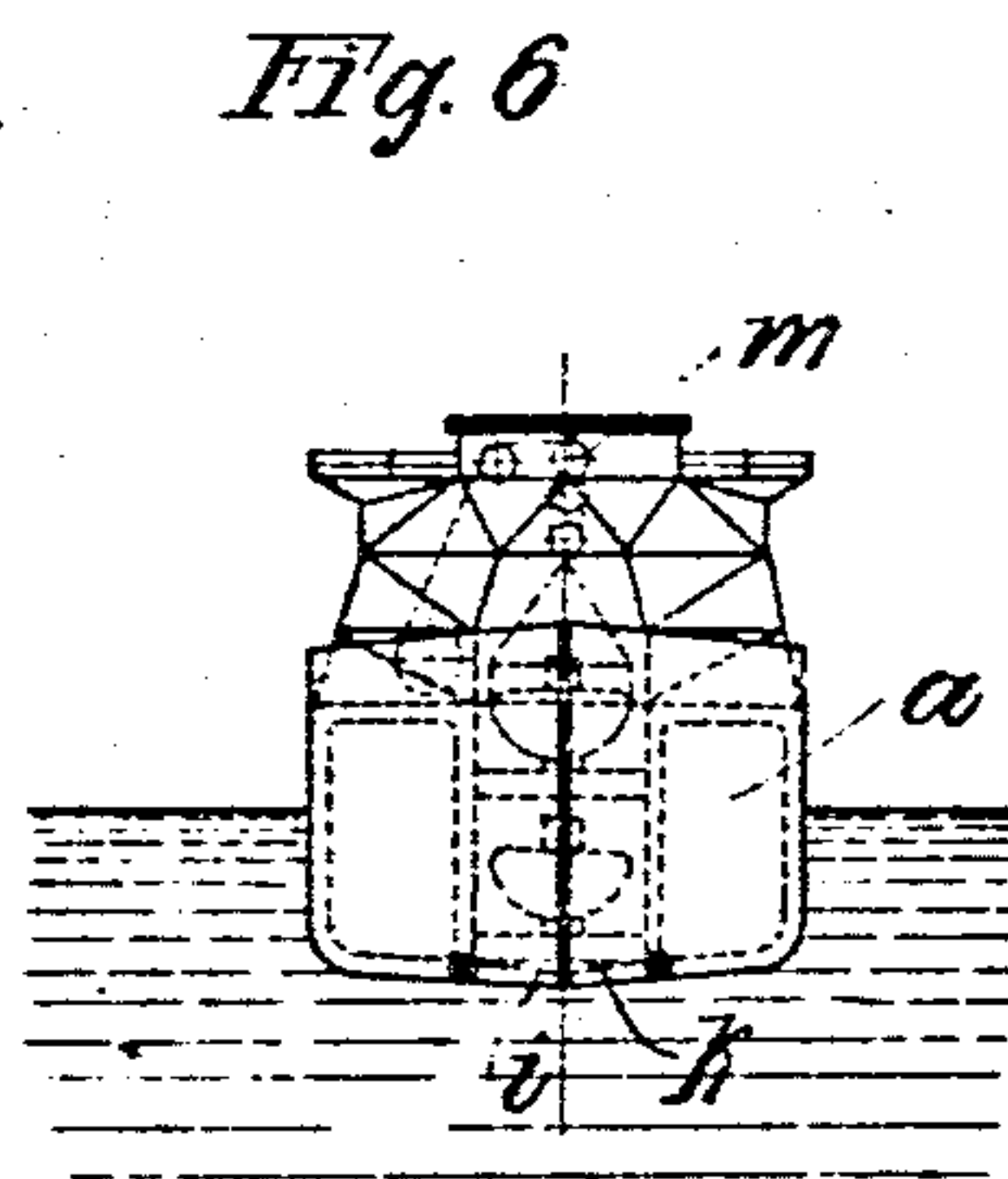
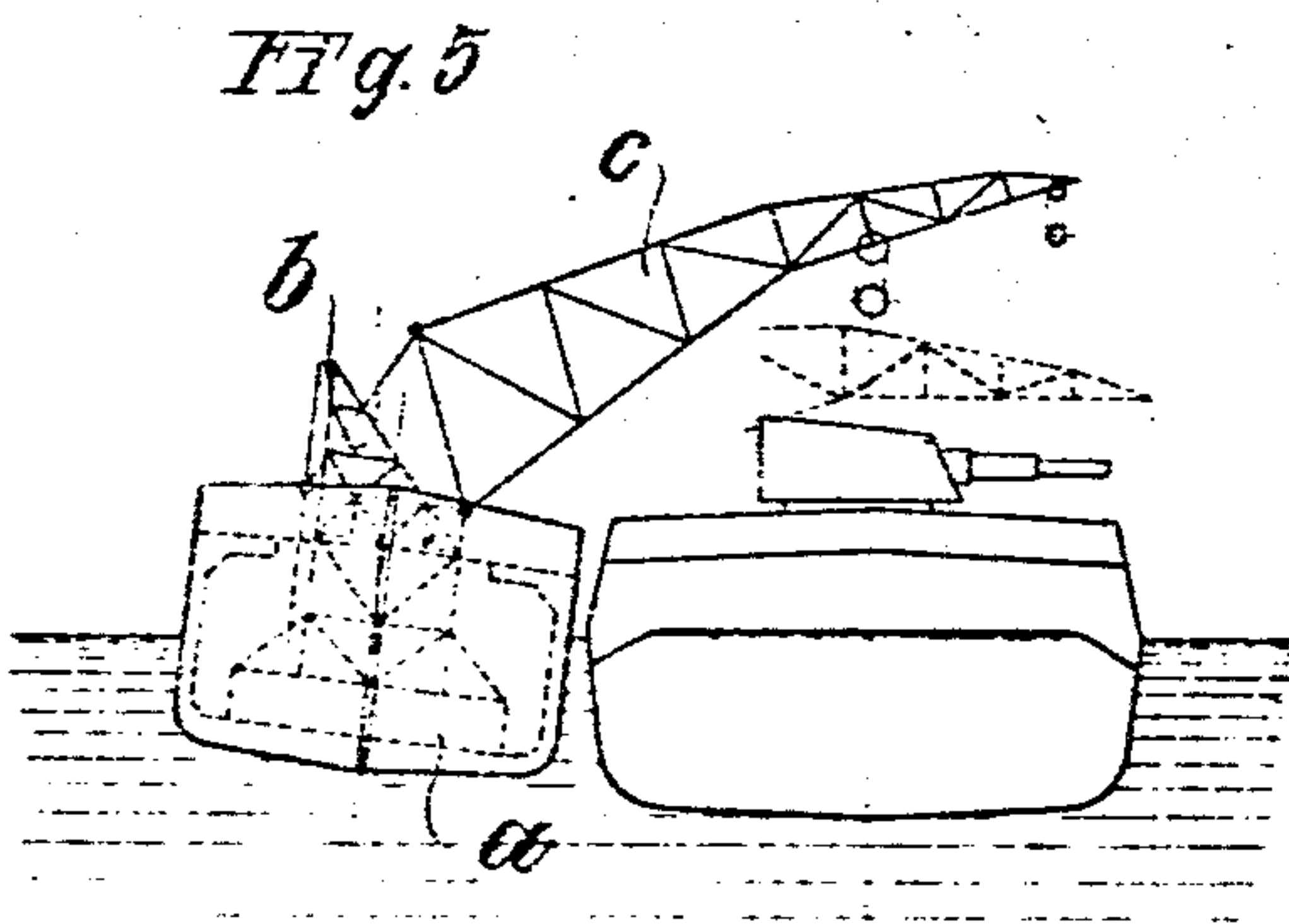
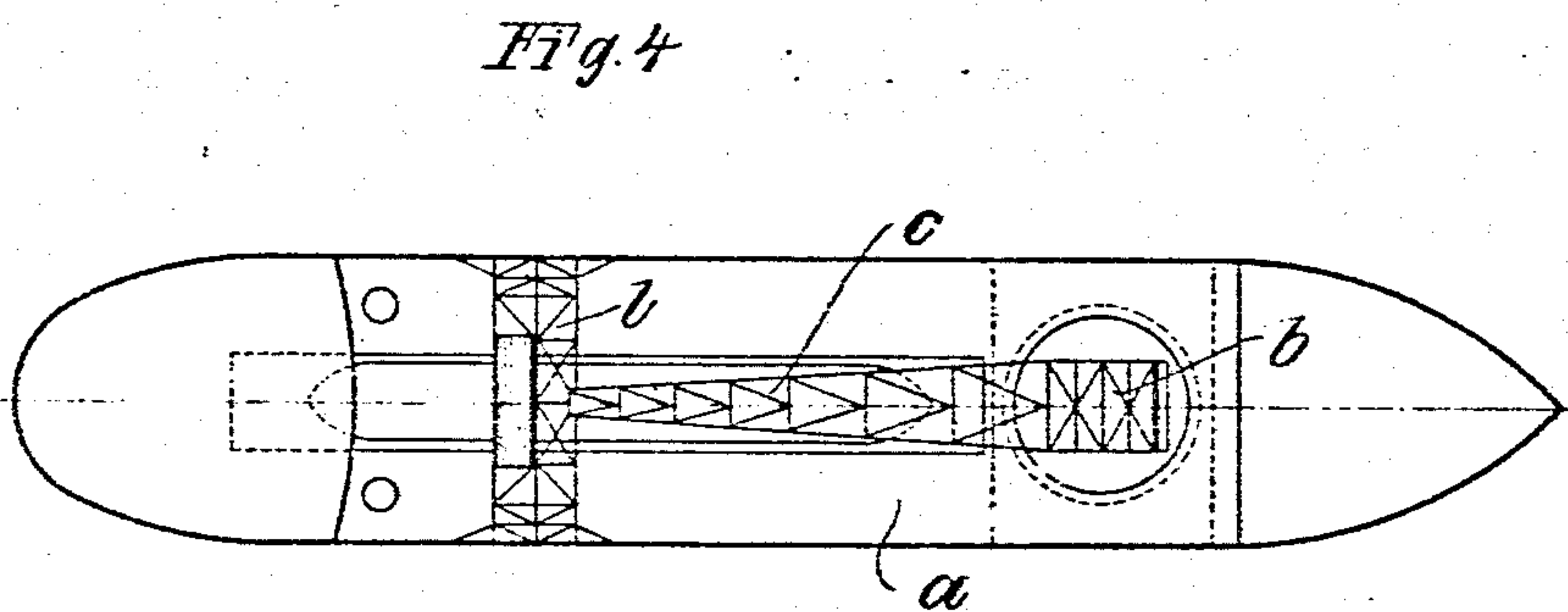
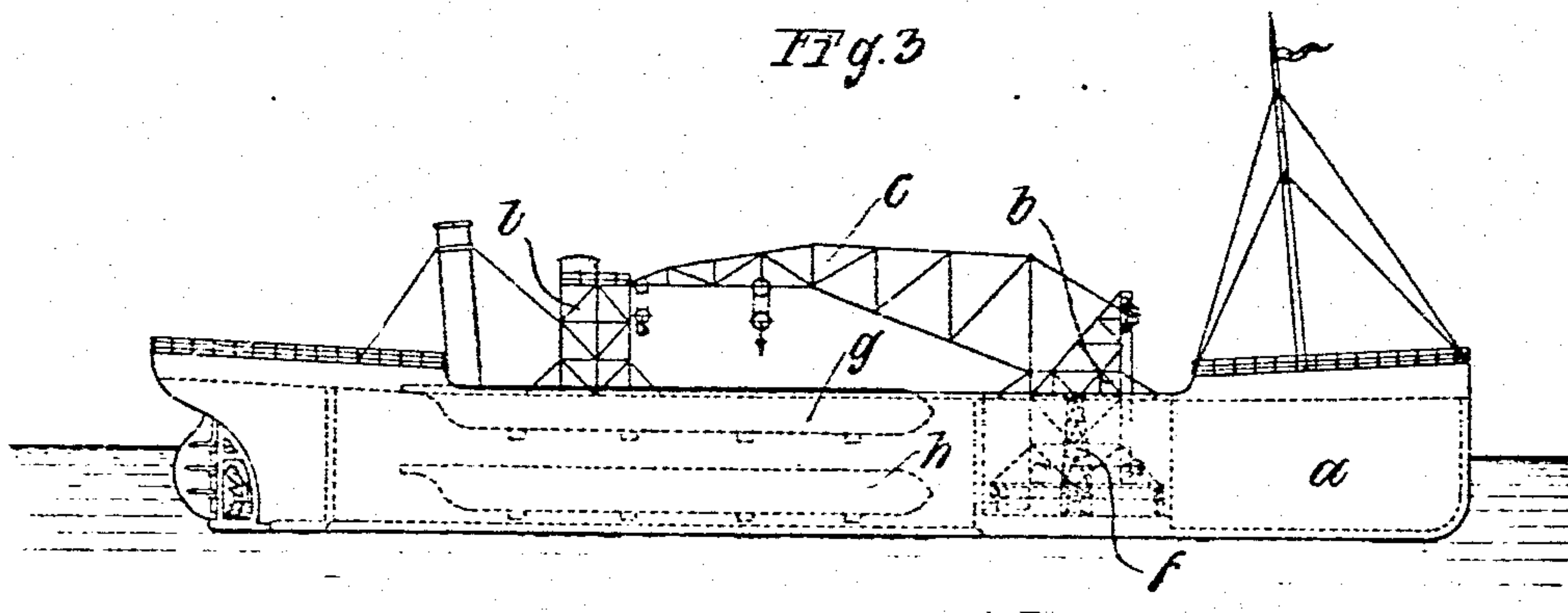
Inventor:
Alfred Bode.

A. BODE.
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2 SHEETS—SHEET 2.



Witnesses:
Earl Hummick
Earl Lammert

Inventor:
Alfred Bode.

UNITED STATES PATENT OFFICE.

ALFRED BODE, OF HAMBURG, GERMANY.

FLOATING CRANE.

948,304.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed August 26, 1909. Serial No. 514,808.

To all whom it may concern:

Be it known that I, ALFRED BODE, engineer, a subject of the German Emperor, and a resident of Hamburg, Germany, have invented new and useful Improvements in Floating Cranes, of which the following is a specification.

The invention relates to crane-ships, and particularly to floating cranes which will be seaworthy and which may be moved any desired distance from their usual moorings; also, to crane-ships which are adapted to transport smaller vessels whose range of operation is less than that of the said crane-ship.

In floating cranes as heretofore usually constructed, the floating bodies are designed to act solely as supports for the cranes, which are arranged on the decks of comparatively low pontoons. The center of gravity of the entire mass, in such floating cranes, is naturally situated at a considerable distance above the level of the water, and as, moreover, such floating bodies have a comparatively shallow draft, it follows that such cranes are very likely to capsize whenever any considerable disturbance of the water arises. Vessels of the kind referred to consequently cannot be removed to any great distance from their usual moorings, as they must be in a position, whenever the weather outlook appears threatening, to take shelter at some previously known place where their safety cannot be endangered by a too rough sea.

Now the present invention obviates this disadvantage by so constructing the floating body of the crane as to render the crane seaworthy even when a high sea is running. This is effected by arranging the greater part of the framework of the crane together with the elevating mechanism and the counterweight requisite to impart lateral stability to the ship, in the interior of the hull, with the result that the height of the center of gravity of the entire mass of the crane-ship does not exceed that permissible in order that the entire structure may remain seaworthy.

The present invention, also, has for its object to arrange the crane structure in such a manner that horizontal forces are not transmitted to the side walls and deck of the ship; and, further, to allow for the carrying upon the crane-ship of a number of smaller independent ships, as submarine boats and

the like, which are transported to the place where they are to be employed and then placed in the water by the hoists in the crane-ship; and, after use, are again placed on the vessel.

The crane may be constructed either as a revolving crane, or as a stationary crane. If the crane is of the revolving type, it may either be provided with a rigid, external supporting frame in the form of a pyramid having two, three or more sides, in the interior of which the column carrying the jib turns; or, its construction may be such that the crane-frame which supports the jib surrounds and rotates upon a column rigidly secured within the ship. In either case, the entire winding mechanism together with the counterweight may be located close to the ship's bottom, so that the vessel remains seaworthy even under the most unfavorable conditions.

The invention is illustrated in the accompanying drawings in which—

Figure 1 shows a crane in which the column supporting the crane jib is rotated, and Fig. 2 shows a crane in which the framework supporting the crane jib is rotated about a column secured within the ship. Figs. 3—6 show a crane ship with special features for the transport of submarine boats.

Similar characters of reference designate corresponding parts throughout the several views.

The outer supporting frame may of course be so constructed as to form part of the vessel *a*. The upper part *b* of the turning crane may be of any desired type. It may, for instance, be provided with a jib *c* that can be drawn in, or with an obliquely or horizontally arranged jib that may be rigidly connected with the rotatable part *b*, and be provided with a traveler, or, it may be constructed in any other suitable manner. Should the crane be rigidly connected with the ship and so constructed as to be incapable of rotation, it is most advantageous that the winding mechanism be arranged directly on the bottom of the vessel *a*.

The essential feature of the construction consists in the fact that the framework supporting the crane is located substantially within the interior of the hull, so that the crane, passing through all the decks, extends downward to the bottom of the ship. The crane may be provided with a rigid external supporting frame in the form of a pyramid *e*

having two, three or more sides in the interior of which the column carrying the jib turns, or its construction may be such that the crane-frame rotates upon a column *f* rigidly secured within the ship. In either case the arrangement is such that the horizontal forces are not transmitted to the sides, or deck of the vessel.

A ship provided with one or more cranes arranged as described may serve as a floating work-shop for repairing other ships; and it can also be employed for transporting heavy pieces of machinery ordnance and the like. It may, moreover, be employed to raise by means of its cranes, smaller independent ships, as submarine boats and the like, and to stow them either on deck and in the hold for the purpose of transporting these ships, the range of operation of which is less than that of the crane-ship; to the place where they are to be employed. The hull of the crane-ship must in this case of course be suitably constructed to enable the ships taken on board to be properly stowed. For this purpose the rooms to stow the submarine boats may, for instance, be constructed as shown in Fig. 3 in such a manner that they can be brought in communication with the water by doors in the bottom, so that the boats can be brought to the water and be taken up from beneath by the crane through the bottom of the ship. The doors which close the openings in the bottom may consist of several pieces fitting together lengthwise, the doors being in the form of watertight hollow bodies, so that in consequence of their buoyancy only little force is necessary to move the doors. The dimensions and the weights can be chosen in such a manner that by letting water into the doors or into the rooms for the boats, the doors will open automatically and will also close automatically in pumping the water out of the interior of the said doors.

In the vessel *a* which carries the crane *b*, a room is separated in the after part by watertight bulkheads in which two submarine boats *g* and *h* may be stowed, the one over the other. During the transport the boats rest in known manner on removable or folding supports; and, in the form shown, the doors are formed by two leaves *i* and *k* being fastened with hinges to the ship. The leaves can be moved in various ways as by means of steam, electric or hydraulic power, or by pumping water in or out.

Instead of stowing the submarines in the after end of the vessel, they might also be stowed in the forecastle.

If the crane-vessel is to transport submarine boats whose weight and dimensions surpass the normal capacity and outreach of the crane structure necessary for other purposes, then over the pit containing the boats a trestle *l* of iron-structure with winding

mechanism *m* is erected. This trestle is constructed in such a manner that the jib of the crane will rest on it when in its lowest position. In this manner, when its end rests upon the trestle, the jib is no more a projecting arm, but a beam on two supports, and can be constructed much lighter than would otherwise be necessary. The boats, further, may be held at two or more places, the trestle being also provided with a hoist, and the hooks can be closer to the boats. The distance of the hook from the boats would otherwise be very great, were a boat to be held at more than one place by means of auxiliary ropes from the single hook suspended from the jib of the crane.

Floating crane vessels according to this invention may, of course, be constructed to carry one crane only, or a plurality of cranes.

I claim:—

1. The combination with a seaworthy vessel, of a crane, and a suitable supporting framework and operating mechanism for said crane, the same being located substantially within the said vessel and supported by the bottom thereof only, whereby no stresses are at any time communicated to the sides or to the deck of said vessel and the center of gravity of the entire mass of the crane-ship is sufficiently lowered to insure the stability of the same.

2. The combination with a seaworthy vessel, of a revolving crane-structure and a jib carried thereby, a rigid column surrounded by said crane structure, supported by the bottom only of said vessel and passing through the deck or decks of the same to carry said revolving crane structure, and operating mechanism for said crane, the same being located substantially within the said vessel and supported by the bottom thereof only, whereby no stresses are at any time communicated to the sides or to the deck of said vessel and the center of gravity of the entire mass of the crane-ship is sufficiently lowered to insure the stability of the same.

3. The combination with a seaworthy vessel, of a crane, a suitable supporting framework and operating mechanism for said crane, the same being located substantially within the said vessel and supported by the bottom thereof only, whereby no stresses are at any time communicated to the sides or to the deck of said vessel and the center of gravity of the entire mass of the crane-ship is sufficiently lowered to insure the stability of the same, and means within the reach of said crane to retain a ship or ships of less range of operation than the said crane-ship.

4. In a crane-ship: a crane; a suitable supporting framework and operating mechanism for the same, and located substantially within the hull of said ship; and a compartment provided with a communica-

tion to the sea, and means to open and close the said communication.

5. In a crane-ship: a crane; a suitable supporting framework and operating mechanism for the same, and located substantially within the hull of said ship; and a compartment within the reach of said crane, provided at the bottom with a communication to the sea, and means to open and close the said communication.

6. In a crane-ship: a revolving crane structure, and a jib carried thereby; a suitable supporting framework and operating mechanism for the same, and located substantially within the hull of said ship; and a trestle carried by said ship to support one end of the jib of said crane structure when the same is in its lowest position.

7. In a crane ship: a revolving crane structure, and a jib carried thereby; a suitable supporting framework and operating mechanism for the same, and located substantially within the hull of said ship; a compartment provided with a communication to the sea, and means to open and close said communication; and a trestle carried

by said ship, located transversely with respect to the length of the ship and over the said compartment, to support one end of the jib of said crane when the same is in its lowest position.

8. In a crane-ship: a revolving crane structure, and a jib carried thereby; a suitable supporting framework and operating mechanism for the same, and located substantially within the hull of said ship; a compartment provided with a communication to the sea, and means to open and close said communication; a trestle carried by said ship, located transversely with respect to the length of the ship and over the said compartment, to support one end of the jib of said crane when the same is in its lowest position; and winding mechanism carried by said trestle.

In testimony whereof I have signed my name to the specification in the presence of two subscribing witnesses.

ALFRED BODE.

Witnesses:

ERNEST H. L. MUMMENHOFF,
OTTO W. HELLMRICH.