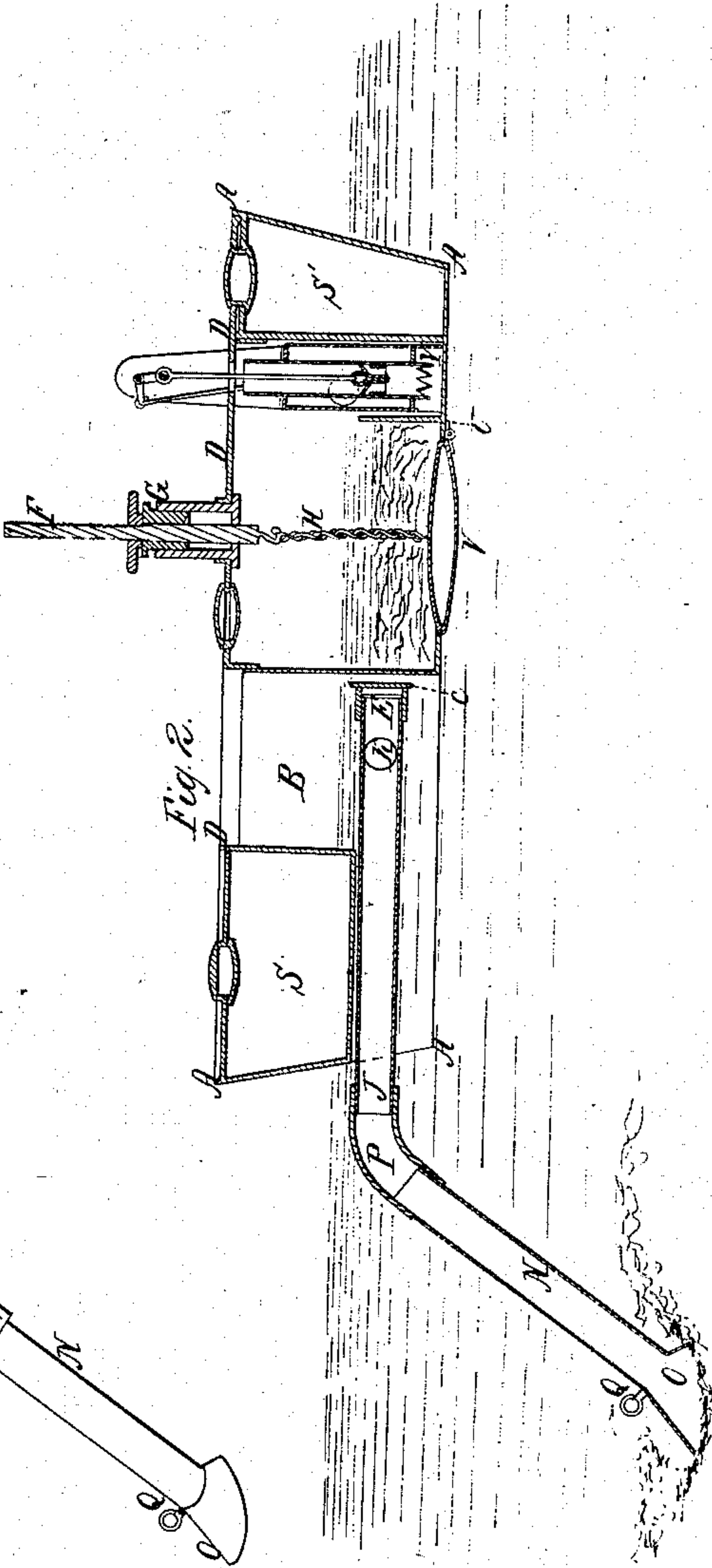
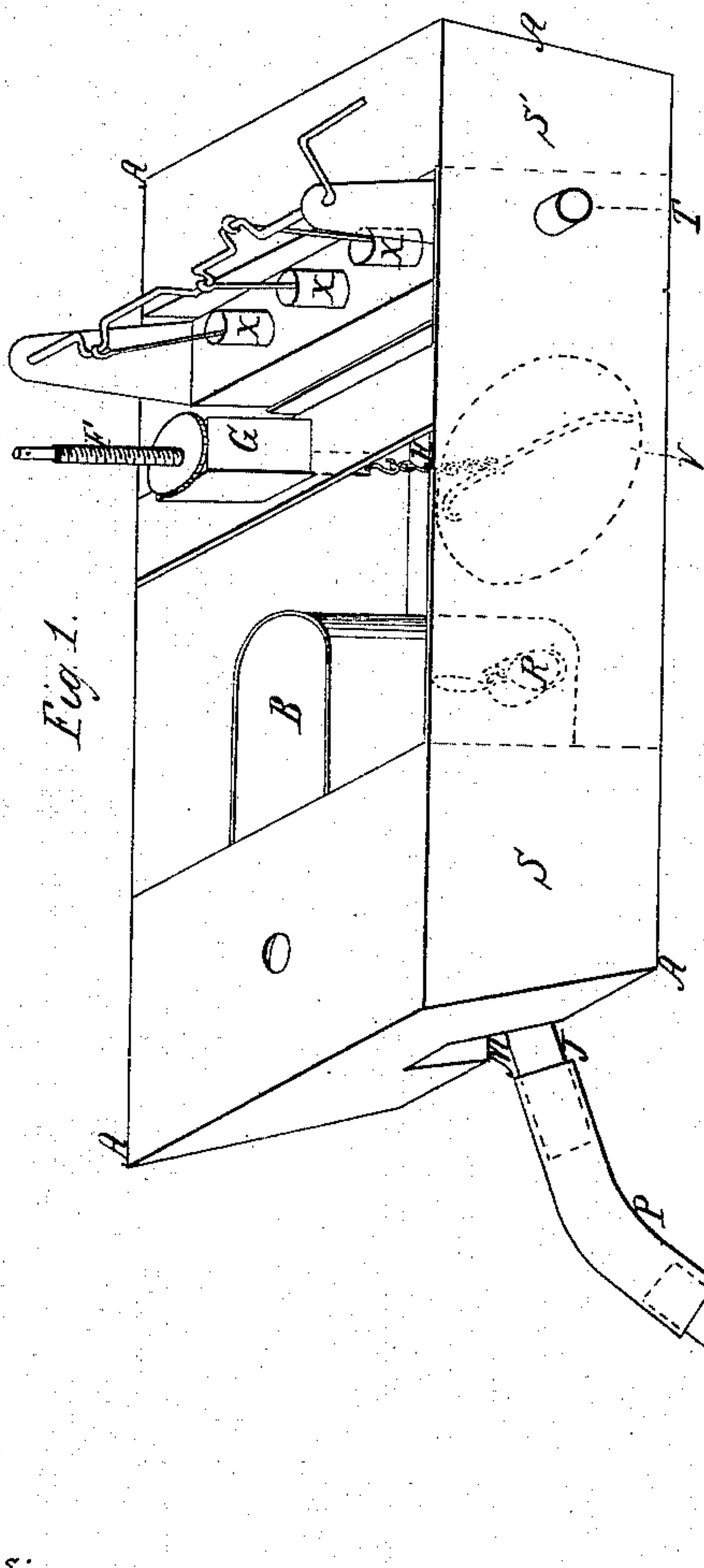
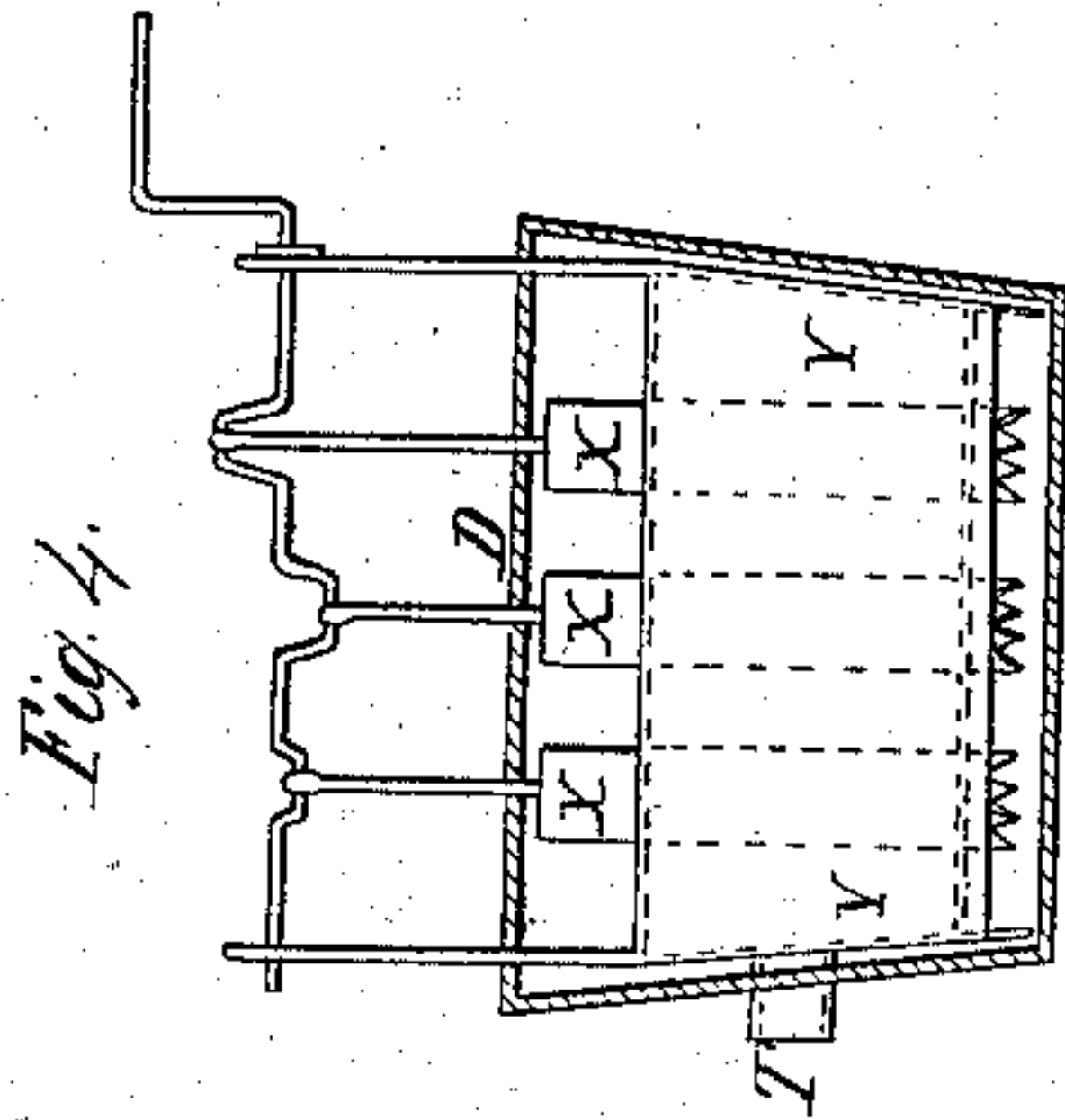
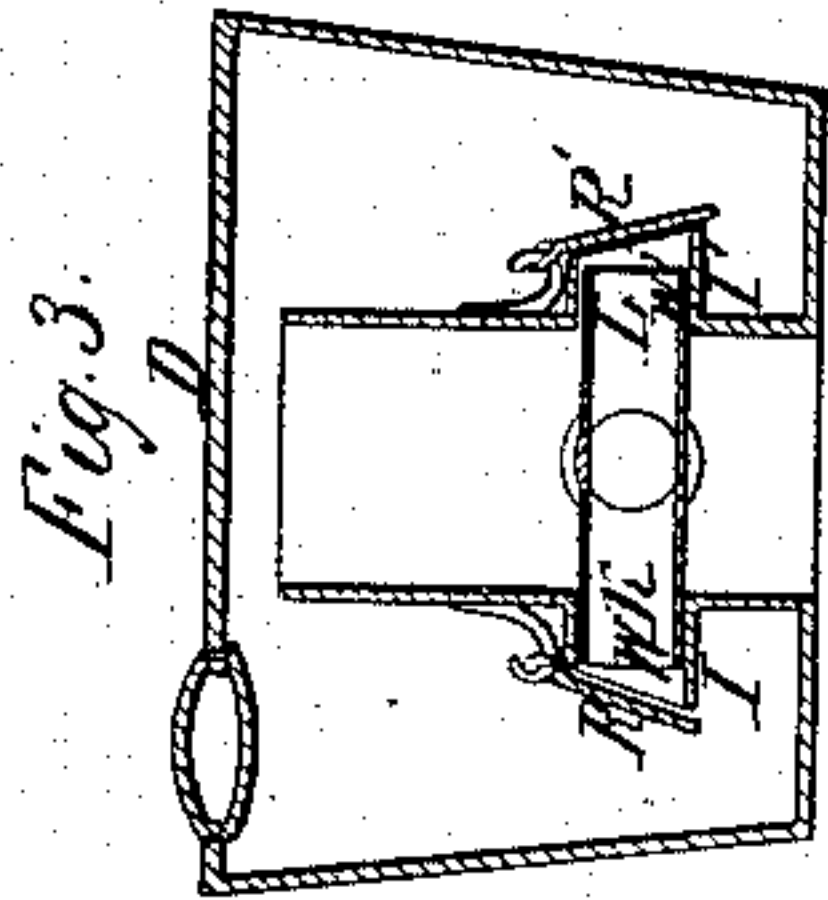


J. Johnson.

Dredging Machine.

N^o 56,948.

Patented Aug. 7, 1866.



Witnesses;
J. C. Milliken
J. S. Moody

Inventor;
John Johnson

UNITED STATES PATENT OFFICE.

JOHN JOHNSON, OF SACO, MAINE.

IMPROVED DREDGING-MACHINE.

Specification forming part of Letters Patent No. 56,948, dated August 7, 1866.

To all whom it may concern:

Be it known that I, JOHN JOHNSON, of Saco, in the county of York and State of Maine, have invented a new and useful Improvement in Dredging-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters and figures marked thereon.

The main feature of my invention consists in providing a boat, scow, or vessel of suitable size and shape, which, at pleasure, can be made air and water tight. To this vessel I attach a suitable tube or trunk in such a manner that it may be lowered at one end upon the material that is to be dredged. When so placed, I remove, by suitable machinery, the air or water from the interior of the dredging-vessel, causing a partial vacuum, and the material to be dredged is elevated through the tube into the scow or other vessel by the pressure of the atmosphere.

Figure I is a perspective view of the apparatus. Fig. II is a longitudinal section. Fig. III is a section of the cross-tube and valves. Fig. IV is an elevation of the pumps.

The barge or scow is made of suitable size for the intended purpose and strong enough to sustain the required pressure when the interior is exhausted of air or water.

In the center of the vessel, or near it, there is a suitable well-chamber, B, large enough to admit a person to pass down from the deck D to reach and open the cap or valve C on the end of the tube E, to afford opportunity for the removal of obstructions from the crossed portion K L at the inboard end of the tube E, in case the passage into the barge or receptacle becomes choked and the dredger rendered inactive.

The bottom of the barge is provided with a suitable seat and valve, V, for the purpose of discharging the dredged contents. This valve can be closed or opened at pleasure by means of the screw F. The shaft of the screw passes through the stuffing-box G, and is connected with the valve by the chain H.

Along the center of the barge, and in continuation of the well B, it is desirable to construct a recess, M, toward the rear, so that the tube E J, when not in use, may be raised to a horizontal position. The tube E J is made of

strong sheet-iron, firmly riveted. The end where it enters the barge at either side, as at I I', Fig. III, is in the form of a cross, and may be made of cast-iron. Its ends are turned to fit the bearings W W', and are made water-tight.

At the outer end, J, of the tube E J connection is made with a similar tube, N, by means of a flexible joint, P, or a ball-and-socket joint. When the machine is at work this joint relieves the strain upon the journals I I' of the cross-tube K L.

The outer end of the tube N is bell-shaped, as at O, in order that it may present a larger surface to the mud or sand than the area of the mouth of the tube. Near the outer end of this tube there is a ring, Q, to which a tackle is secured, extending to a crane or capstan on deck, for the purpose of raising or lowering the tube.

The barge A having been filled with water to its water-load line through the valve V, or other suitable opening, the valve is then closed, the tube E J N is lowered until its foot O rests upon the mud, sand, or other material to be dredged. The pumps X are then put in operation, and the water is discharged at the orifice T, just above the water-line, thereby causing a partial vacuum in the barge. The atmospheric pressure upon the water outside forces up the mud or sand, which passes up the tube and is deposited within the barge. Thus as the water is removed the sand takes its place, sufficient water being combined with the sand to render it semi-fluid and capable of transit from below to the barge above.

While the barge is being filled it becomes necessary gradually to warp it forward, so that an even depth may be excavated or dredged.

To prevent any portion of the dredged materials from returning through the cross and tube there are flap-valves R R' at the mouths of the cross-tube K L. During the action of the pumps these valves remain partially open, and when the pumps stop they close by gravity and the pressure of the sand that is near them.

When the barge is filled to the load-line, and just before the pumps are stopped, it is desirable to hoist the end of the tube N O, so that all the mud and contents may be drawn up and deposited within the barge. This in-

sure a free tube ready for the next load. The barge is now moved to the place of deposit, the valve or trap V is opened, the sand falls out and is deposited on the bottom. The barge immediately fills with water. The valve V is now closed by means of the screw and chain H F, and the water may be pumped out, provided the flap-valves R R' are made tight. This may be done while the barge is returning to the locality for dredging. The tube being again lowered to the bottom, the valves are released and the pumps again put in operation.

The barge is provided with air-tight compartments S S', of sufficient buoyancy to float the boat when fully loaded.

The pump-well Y' is situated within a bulk-head U, the top of which is about level with the top of the load of dredged material. The water which enters the barge with the sand or mud flows over the top of this bulk-head and into the well.

The important features of this invention for dredging are that the mud or sand can be removed from the place of accumulation into the barge without elevating it above the water-level, the materials being lifted at a very small cost for power compared with that required to dredge where the whole of the gravity of the mass has to be overcome. The mechanism is less expensive and its management less difficult than that of dredgers heretofore made.

In the direct application of the apparatus, where the air or water is removed and the

mud or sand occupies its place, a very little tension per square inch is necessary, as the submerged material moves freely, being permeated by water, and its weight is about two-fifths less than it is in the air.

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

1. The system or mode of dredging, consisting of an air-tight flexible supply-tube, an air-tight floating barge or vessel, and suitable pumps for removing air or water from the vessel, substantially as herein described.

2. In combination with an air-tight floating barge, the discharge-valve V and the bulk-heads that allow the water to flow over them into the pump-well as it is displaced by the entrance of sand or other dredged materials.

3. The cross-tube K L, in combination with the main supply-tube, as specified.

4. The combination of the cross-tube K L with its bearings I I', for the purpose of raising and lowering the tube without disturbing the position of the orifices through which the mud or sand passes.

5. The combination of the cross-tube with the cap or stopper C, so fitted that it can be taken off for the purpose of removing obstructions, substantially as herein set forth.

JOHN JOHNSON.

In presence of—

JOS. L. MILLIKEN,
JOS. S. MOODY.