Sheet 1. 2 Sheets.

C. Krogh.

Camel and Floating Dock.

No. 39,818. Patented Sep. 8, 1863.

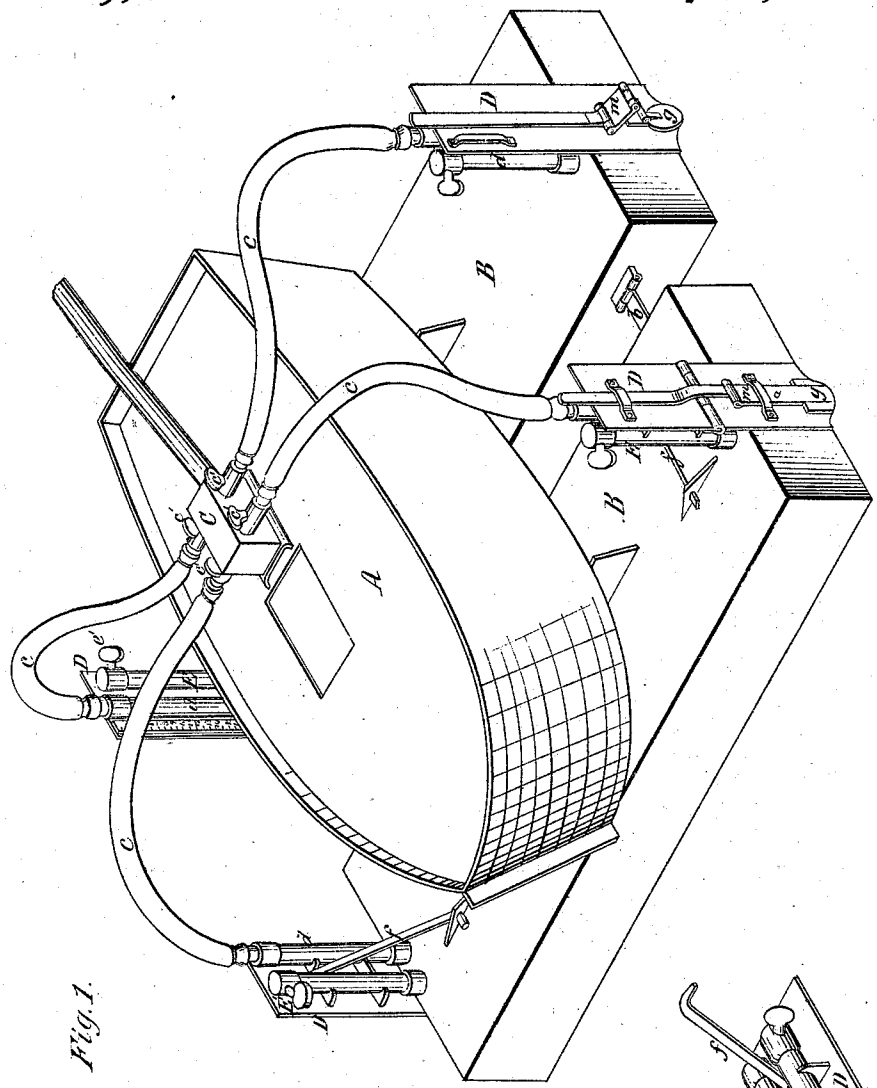


Fig. 1.

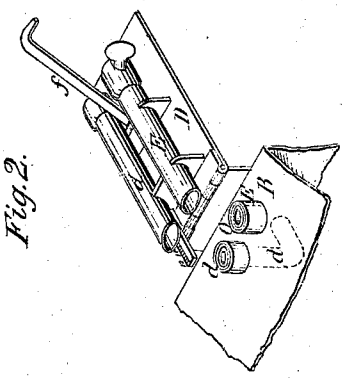


Fig. 2.

Witnesses.
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S. H. Keller

Inventor.
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Sheet 2. 2 Sheets.

C. Krogh.

Camel and Floating Dock.

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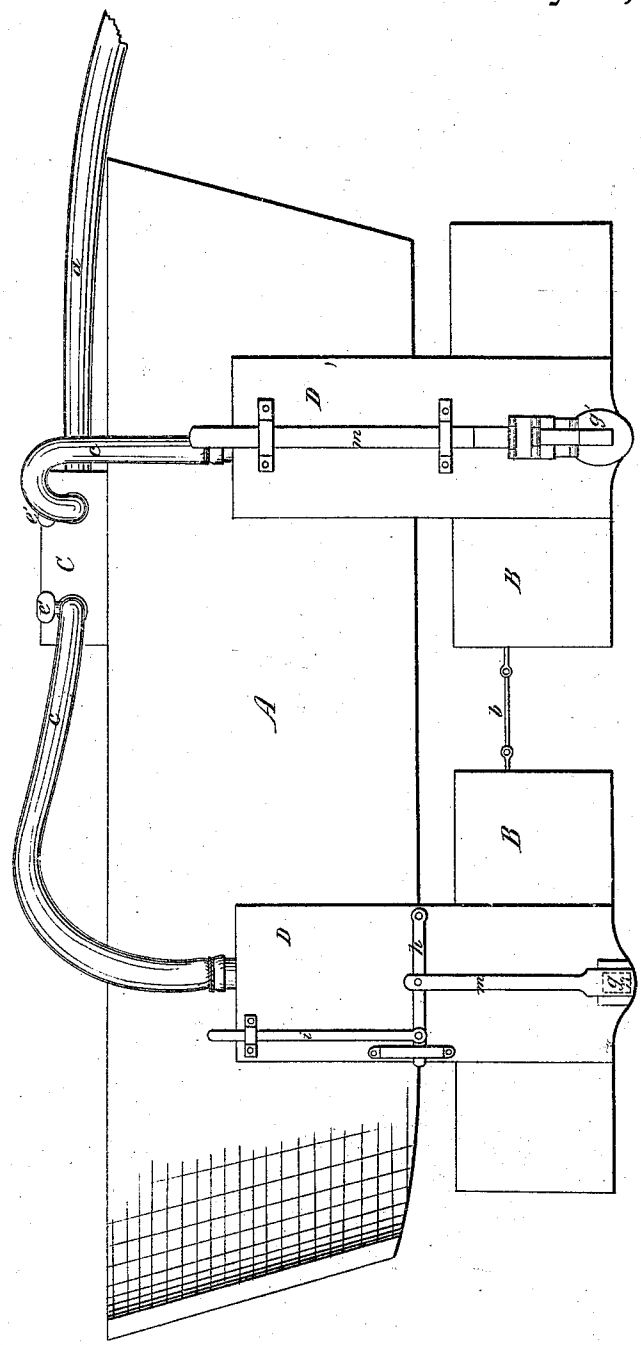


Fig. 3.

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UNITED STATES PATENT OFFICE.

CASPER KROGH, OF KROGHVILLE, WISCONSIN.

IMPROVEMENT IN DRY-DOCKS.

Specification forming part of Letters Patent No. **39,818**, dated September 8, 1863.

To all whom it may concern:

Be it known that I, CASPER KROGH, of Kroghville, in the county of Jefferson and State of Wisconsin, have invented a new and useful improvement in floating dry-docks for lifting vessels out of the water and supporting the same for repairs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and the letters and figures marked thereon, which form part of this specification.

In the said drawings, which are hereunto annexed, Figure 1 represents a perspective view of my invention. Fig. 2 shows a perspective view of the interior side of one end of the docks B B; and Fig. 3 shows a side view of invention, illustrating the position of a vessel resting thereon.

Similar letters of reference denote corresponding parts of my invention in the different figures in the drawings.

The object of this invention is to obtain a floating dry-dock upon which vessels may be built and readily launched or let down into the water, and which can be placed under damaged vessels and so placed that sunken vessels can be floated upon or over them and raise them up above the surface of the water, and support the same while being repaired, and which can be built and operated much more easily, much more rapidly, and much cheaper than dry-docks constructed in the ordinary manner, thus making it a time-saving, money-saving, and labor-saving invention.

My invention consists in placing two or more oblong water-tight lifters transversely beneath the bottom of the vessel to be raised, and in filling the said lifters with air by a peculiar arrangement of parts and in a peculiar manner, and in other important particulars hereinafter fully described and set forth.

To enable those skilled in the art to understand how to construct and make use of my invention, I will proceed to describe it with particularity, reference being had to the drawings hereinbefore mentioned and hereunto annexed.

A represents the vessel resting upon the docks B B, which are constructed of sheet-iron or wood, or other suitable material, and made air and water tight, and are each partitioned or divided into two or more chambers by walls passing through them transversely. There may be one of these partitions through the center, dividing the entire interior of each into two compartments, or there may be two or more partitions arranged across the dock, so as to provide more certainly against one end rising more rapidly than the other, as by graduating the amount of air admitted into each compartment the dock may be sunk or raised in a horizontal position with great readiness and certainty.

The several docks are connected together by means of the hinged rods *b b*.

C represents an air-tight chest, into which the air is forced, and from which it is distributed through the flexible pipe *c c* into the various compartments in the docks B B, it requiring as many flexible pipes *c c* as there are compartments in said dock. The induction-pipe, through which the air is forced into the air-chamber C, is represented by *a*.

D represents wide flat posts or standards attached to each end of the docks B B, the objects of said vertical standards being these: They serve as supports for the tubes *d* and *e*, *d* being the tubes to which the flexible pipes *c* are fastened by being screwed thereon, or in any other suitable manner, which tubes extend down through the top of the docks to the bottom thereof, and whose lower end curves upward, the said lower end lying in a basin or depression in the bottom of the dock, so that when the water is expelled from the docks the mouth of the said tube *d* is still covered with water and so sealed as to prevent the escape of the air. The tube *e* only extends through the top of the dock, and its office is to let the air escape when desirable by opening the stop-cock *e'* at the upper end, said stop-cock being closed when the docks are being filled with water or are required to be filled with air. The said uprights D also serve as supports for the rods and levers *m h i*, by which the valves *g g*, which shut and open the outlets *n*, whence the water escapes or is forced out from the docks, are operated, as shown. The said standards D are also provided with a groove, in which the adjustable or removable scale-board *s* is placed, plainly divided into foot-spaces and numbered from the top, as shown, said scale-boards being placed so as to be seen readily from the air-distributer C, so

that a person stationed at said distributer C can, by means of the stop-cocks c', so regulate the admission of air into the docks as to keep them exactly level, the figures on the said scale indicating clearly when said docks are level, as aforesaid. The said scale-board may be fixed upon the standard D, but I prefer to have it removable, else the figures may be obliterated by the action of the water, if the scale was stationary and fixed upon the standard. The valves closing the outlets whereby the water escapes from the docks may be closed by a sliding valve, as g, or a cushion-valve opening and closing, as shown at m'. The flexible induction-pipe a is connected with a blowing apparatus, placed either on deck or in the dock-yard, or the blowing apparatus with an engine or other motor and the air-distributer C may compose one machine and be placed upon the deck or elsewhere, as desired. If a sunken vessel is to be raised, and should have to be brought upon the docks with lifters attached to the sides of the vessel, as described in my former patent for raising sunken vessels, and the docks should be too narrow between the standards D D to admit the vessel thus encumbered, these docks may be constructed with reference to this objection by providing the said standards and the valve-rods with suitable hinges and the tubes d and e with suitable joints or connections to allow the said vertical standards D D to open outwardly, as shown in Fig. 2, which arrangement would permit the encumbered vessel to be floated upon the docks, and, when the lifters are detached from the sides of the vessel and removed, the standards D D and tubes d e may resume their upright position and be fastened by the stay-hook f, as shown in the drawings. When there are three compartments in the docks B, the central one may be kept filled with water, as the balance could be better kept with such a ballast; but the lifters or docks B would have to be much larger to raise the same weight.

The tubes d and e may be provided with a flange at the bottom and bolted to the top of the dock, or the tubes may run down outside the dock and enter at the bottom near the outlet. The joints in the tubes shown at o in Fig. 2, must be provided with a grooved or other suitable packing to make them perfectly tight. The bottom of these docks should be a little higher in the center that the water may all run out, and when sunk to admit the vessel, the valves and tubes should be closed to prevent the ingress of mud or sand.

When a vessel is to be raised up out of the water, it should be placed as near as possible upon the center of the docks, which may be provided with saddles or rests, so as to keep the vessel high enough above the docks to enable the workmen to work under the bottom of the vessel. The water-valves are then opened, and the air-chamber C placed upon the deck, the pipe a being attached to the blowing apparatus, and the flexible pipes c are connected to the tubes d, the stop-cocks e' are closed, and the stop-cocks c' are opened, and the blower set in operation, and a man placed upon the air distributer C, to watch the gradual rising, and to regulate and control the same, as aforesaid, by means of the stop-cocks c'. If thought desirable, a safety-valve may be attached to the air distributer or chamber, so as to let out the air if the blower should operate too rapidly for the capacity of the tubes and pipes. When the water is all driven out, which may be known by the air escaping from the outlets and rising in bubbles through the water, and the vessel raised high and dry, as desired, then the valves may be shut over the water-outlets, and air closed in by closing the stop-cocks c'. It makes no difference whether the stop-cocks c' are closed or not, because the lower orifices of the pipes c in the basin, being covered with water, are effectually sealed. The flexible pipes e may even be unscrewed without the air escaping, but the stop-cock in the upright tube e must always be closed, except when the docks are being sunk.

Hatchways may be constructed in each compartment of the docks to enable workmen to descend into them to make repairs, and also to admit a hand pump being introduced to take out what water might remain therein, if required.

These docks might operate without any bottoms and would operate the same, but would be inconvenient and difficult to repair, and I prefer the docks as described.

Having described my improved floating dry-dock, I will now specify what I claim as new therein and desire to secure by Letters Patent—

1. The combination and arrangement of the air-distributer C, the flexible pipes c c, the tubes d d, with the air tight chambers or compartments B B, constructed and operating substantially as and for the purposes herein delineated and set forth.

2. The combination and arrangement of the stationary uprights D D, the tubes d and e, and scale-board s, substantially as and for the purposes specified.

3. The combination of the hinged standards or uprights D D, the hinged valve-rods m m', the jointed tubes d and e, arranged and operating substantially as and for the purposes described, and shown in Fig. 2.

4. Constructing said lifters or docks B B with the partitions, and providing them with the outlets, valves, and valve-rods, and tubes d and e, substantially as described.

CASPER KROGH.

Witnesses:

ROBERT MCCRACKEN,

A. MCCRACKEN.