S. Loveland.

Dry Dock.

No. 10,600. Patented Mar. 7, 1854.

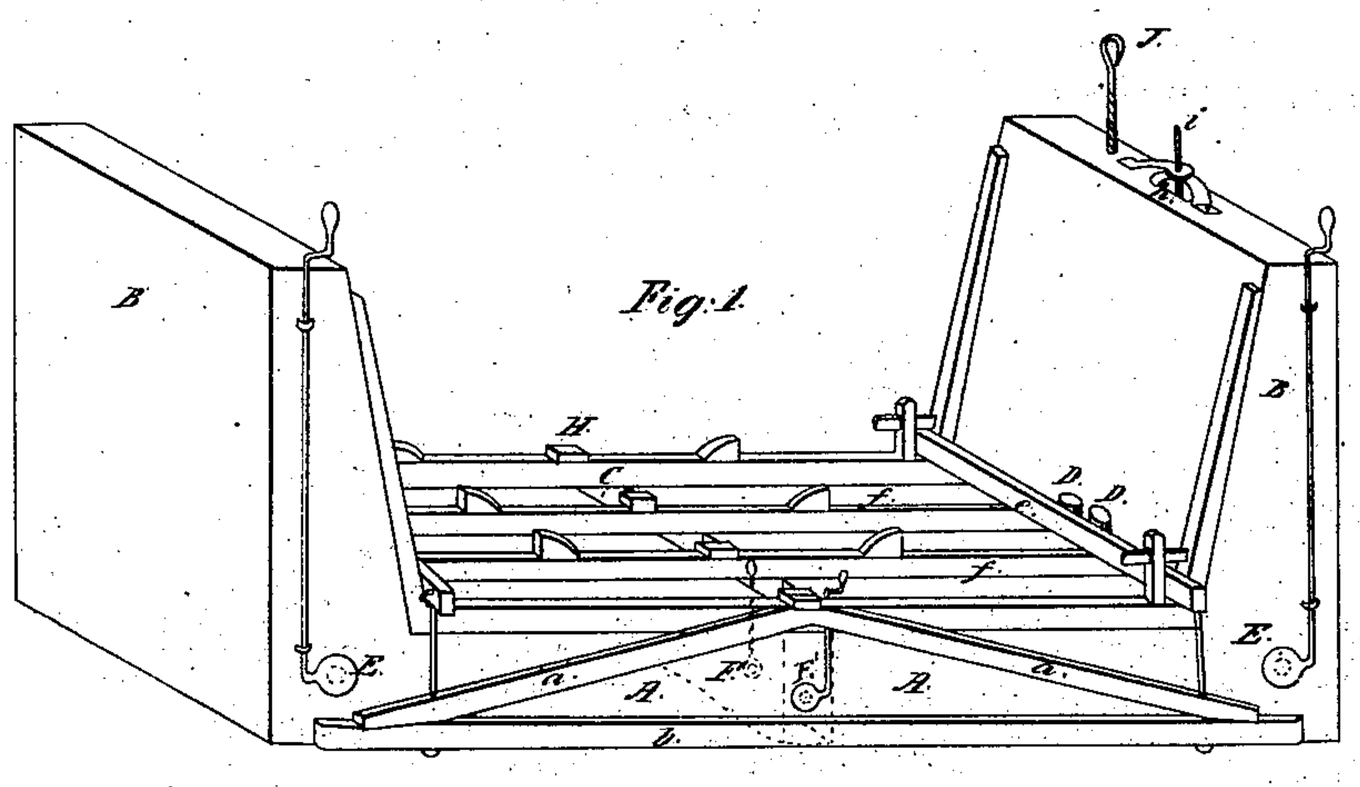


Fig. 1.

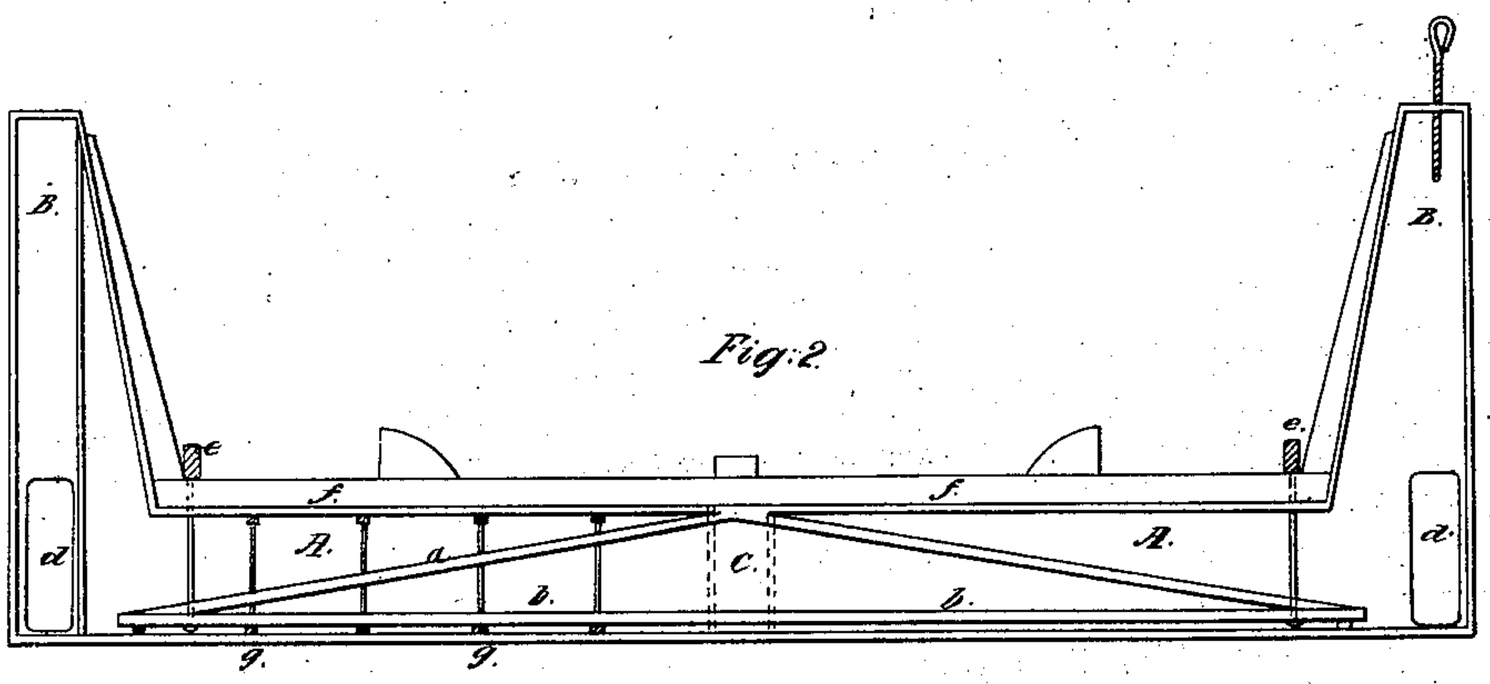
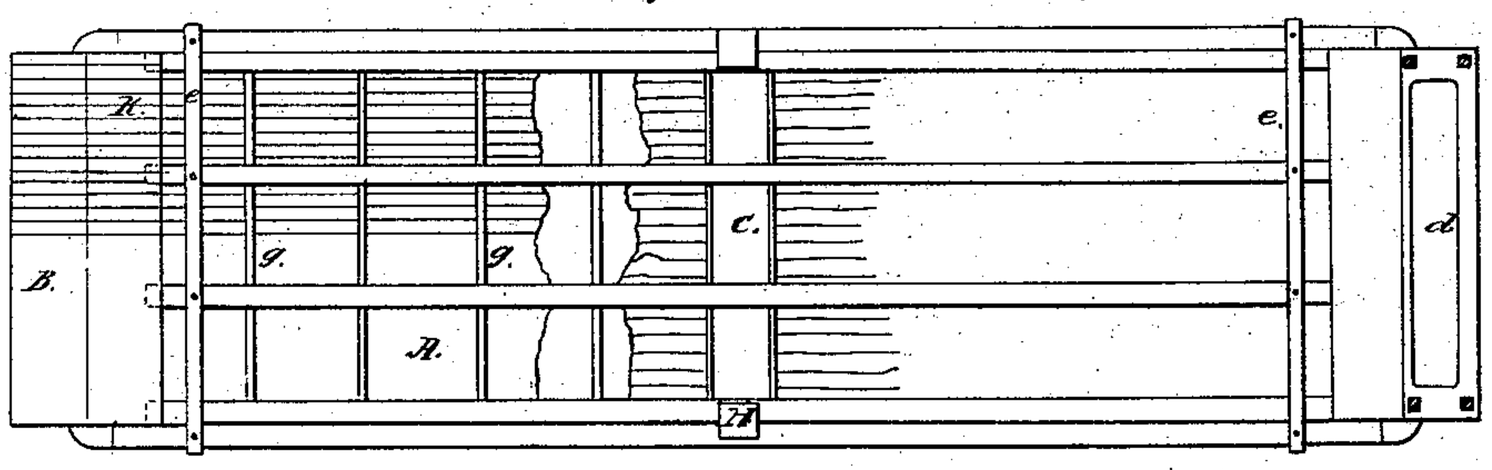


Fig. 2.

Fig. 3.



THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

SAMUEL LOVELAND, OF ASTORIA, NEW YORK.

SECTIONAL DRY-DOCK.

Specification of Letters Patent No. 10,600, dated March 7, 1854; Antedated September 7, 1853.

To all whom it may concern:

Be it known that I, SAMUEL LOVELAND, of Astoria, Long Island, and State of New York, have invented new and useful Improvements in Sectional Floating Dry-Docks, and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification.

This invention is an important improvement on my floating dry dock patented Feby. 5, 1847, by which I am enabled to overcome several difficulties practically found to exist in the use of said dock, the first of which was that of depending on my air chambers, placed above the hollow guards, in the gallows frame for steadying my dock, whereas the effect was, the canting of dock before the guards were raised sufficiently above the surface or even reached it. This arose in part from the difficulty of withdrawing the water equally in the two tanks or separate floats constituting a section of the float. As a leak would occur in one while the other remained tight it was found impossible without extra care to withdraw equal quantities of water and admit equal quantities of air through the open pipes in the end tank, rising above the surface of the water. This canting of the dock rendered the canting of the vessel thereon inevitable. In shoal water this was not to be dreaded, as the application of the pumps on the lower side remedied the evil, but not so in deep water, as it frequently has occurred that the dock itself has sunk. Another difficulty existing was that of throwing the whole weight of the vessel raised on the center of the cross timbers or cradle pieces (uniting the separate floats,) by which they were frequently fractured, and in one instance the entire floats rose from this cause leaving the vessel between them. A further difficulty existing in all other docks was that of getting at the keel, or center board trunk, when repairs were necessary, without involving the necessity of using high blocks or that of the workman lying on his back when making these repairs. Also that with the exception of the separate air tight chamber, which was liable to accident, there was no part of the float itself air tight or capable of containing air when subjected to compression therein, as all other hollow guard docks were open or unprovided with covers capable of retaining compressed air.

Having thus set forth the practical disadvantages found to exist in my first dock, as well as in others, I will now proceed to set forth the advantages of my sectional dock on which this application is based. First, by constructing each section of the dock of a single float, and by the mode of framing the principal timbers thereof, connecting them with each other, and with the more buoyant portions of the dock, viz., the guards or air chambers, and the arrangement of the planking lengthwise of the section, I am enabled to free it from liability of leakage, consequent to cross planking—that is, from side to side of the section. By this arrangement of the framing and planking I am also enabled to construct the dock with less timber than any other, and of greater strength in supporting the weight of the vessel, inasmuch as the incumbent weight instead of being thrown on the center of the cradle pieces is transferred to the string pieces and guards, by which all liability of depression of the dock and straining of the vessel is avoided. I also construct it at less expense of labor and with more buoyant power, consequent upon the reduction of timber, giving the space it would occupy to the occupance of air instead thereof. Secondly, by the introduction of two water tight bulk heads one on each side of the center of the float, I am enabled to create a water ballast in the tank thus formed, directly under—and in the vertical line passing through the keel of the vessel when rising, which in conjunction with the air chambers controllable by valves in the guards, I obviate all difficulty in the canting alluded to in speaking of my first dock. This water tank may be discharged of its water into the body of the float by valves when the float is above water, when it is necessary to have access to the under side of the keel or center board trunk, and as it usually is about four feet wide, it affords free access in such repairs. It is also of advantage in giving greater buoyancy to the dock when pumped out, when the air chambers of the guards are not sufficient. Its chief use is that of a ballast in the center of

the dock, serving the purpose as much so as if it were pounds of iron instead of water. These bulk heads also serve the purpose of preventing water in either end of the float surging from end to end therein. This water ballast or tank in connection with the air tight guards affords us the means of readily trimming the dock to a level and preserving its equilibrium. And by the introduction of the safety air tanks into the air tight guards, all danger of accidental sinking of the dock itself is avoided, even should the guards themselves be stove or prove leaky, while by the conjoined use of the tank in the center of each section, viz., that of furnishing ballast, and at the same time admitting of ready access (by withdrawal of the water) to the keel of the incumbent vessel for repair of the same.

To enable others skilled in the art to construct and use my invention, I will proceed to describe a single section of the dock, any number of which may be used, being connected together in the usual method.

Figure 1 is an isometrical view. Fig. 2, an elevation exhibiting the framing. Fig. 3, a plan showing the tank or water ballast and the mode of planking the bottom of the float exhibited at K to the left of the figure.

The bottom of the section is a parallelogram about 80 feet long by 20 wide and instead of being divided as in my former dock into two floats connected by the cradle pieces, it is a single one, the framing of which will be hereafter described.

A A represent water tight chambers formed of the planked sides, ends of the float, bottom thereof and two bulk heads, extending from side to side, placed equidistant from the center of the float so as to leave a space on the bottom of about 4 feet wide and the depth of the float, say 5 or 6 feet. The deck extends from the guards to the bulk heads, but does not cover the tank C; not but it may be covered over.

The frame of the dock is made of light timber, but so arranged as to produce the best possible effect, both with regard to strength and buoyancy.

a a represent braces united at the center of the dock and extending nearly to the ends of the string or base pieces *b*. They are secured thereto by anchor bolts, pins, &c. This mode of framing is applied under each cradle timber (see Fig. 2) of the dock. The principle of capacity of the arch to resist the incumbent weight when over the junction of *a a*, viz., at the center of the dock, will be apparent, as well as capacity to overcome that of displacement of the water causing resistance on the heels of the braces. This with the plan of planking the bottom of the float as seen at *k*, Fig. 3, transfers this resistance from the heels of the braces to the center of the deck of the float, relieving the string piece or base *b*, as well as the cradle timber *f*, and with the view of equalizing or dividing the strain on the float and to prevent all liability of fracture of the cradle pieces. I connect these heels of the braces by stirrup bolts with cross timbers *e e* placed on the upper sides of the ends of the cradle pieces *f f*. These cross timbers are placed adjoining the hollow guards or more buoyant portions of the dock.

g, *g*, in Figs. 2 and 3, are cross sills secured on the under side of the string pieces and the planking K is spiked to them, extending from end to end of the dock forming a continuous bottom. The air chambers B B are raised on the ends of the floats and on the deck thereof and are made tight, they communicate with the buoyant chambers A A. In the top of each chamber is a valve *h* opening inwardly, controlled by a thumb screw and rod *i* passing through a bridle on the chamber. Through the top of the chamber also passes (air tight) a set screw *j*, to arrest at any desired height the safety air tanks *d*, inside of B B, when the water in A A causes them to float.

D D are pumps entering the body of the float for discharging the water each buoyant chamber being provided with two or more, E E valves for introducing water into the float, and E′ the inlet valve into the tank C; F, a valve in the bulk head, to permit the water to escape from the water tank C into the buoyant chamber A, from which it may be pumped out.

In using the dock, connect as many sections as may be thought necessary to raise the vessel; then open the air valves *h* in the several guards B, also the inlet valves E, E, by which the dock is sunk the desired depth. If it is very buoyant extra ballast may be necessary. It is then floated under the vessel if in deep water, or the vessel floated on the dock. The valves E E are then to be closed and the discharge pumps D D started, which raising the several sections bring the keel blocks H, H, under the keel, when all the sections are thus brought to bear. The puppets or bilge blocks are adjusted to the sides of the vessel; then the pumps of all the sections are worked simultaneously and the vessel is raised to a desired height, bringing the decks of the floats sufficiently high above the water. The air valves *h* are then to be closed and secured and the vessel is ready for repair.

It may be proper to advert to accidents occuring to other docks, such as those at New Orleans and at St. Louis, in which they were sunk by leakage, occuring not from extraordinary accident, but arising from the mode of cross planking on the bottom of each section (instead of lengthwise) which in the strain on the center caused these lat-

erally placed seams to open and leak. In my plan of placing the planking K lengthwise on the bottom this was prevented and that additional strength was given the float as before described.

I am aware that a water ballast has been used extending from stem to stern of a life boat, for the purpose of righting the same; and am also aware that space between separate floats is not new. But

What I claim as my invention and desire to secure by Letters Patent is—

1. The transversely placed tank, trunk or water chamber C of each section of the dock forming not only a central water ballast in the float directly under the keel of the vessel to be raised, but when empty, a dry tank for the purpose of giving access to the keel in repairs.

2. I also claim the tank, trunk or chamber C, in combination with the buoyant chambers or floats A, A, hollow guards or chambers B B, or when combined with chambers or floats attached to the ends of the trunk or float in the manner set forth in the foregoing specification.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

SAMUEL LOVELAND.

Witnesses:
JOHN F. CLARK,
SAML. GRUBB.