T. A. BLAKE.

Hydraulic-Lift Dry-Dock.

No. 168,603. Patented Oct. 11, 1875.

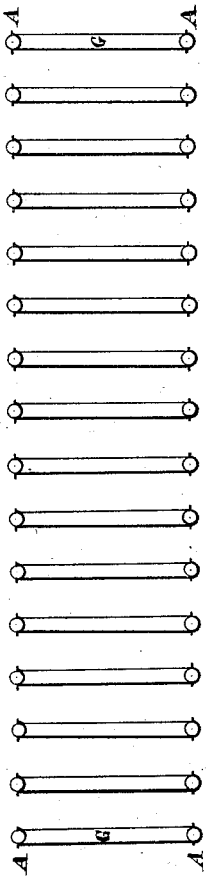

Fig. 1.

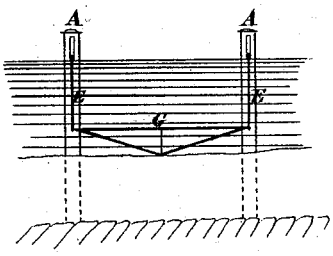

Fig. 2.

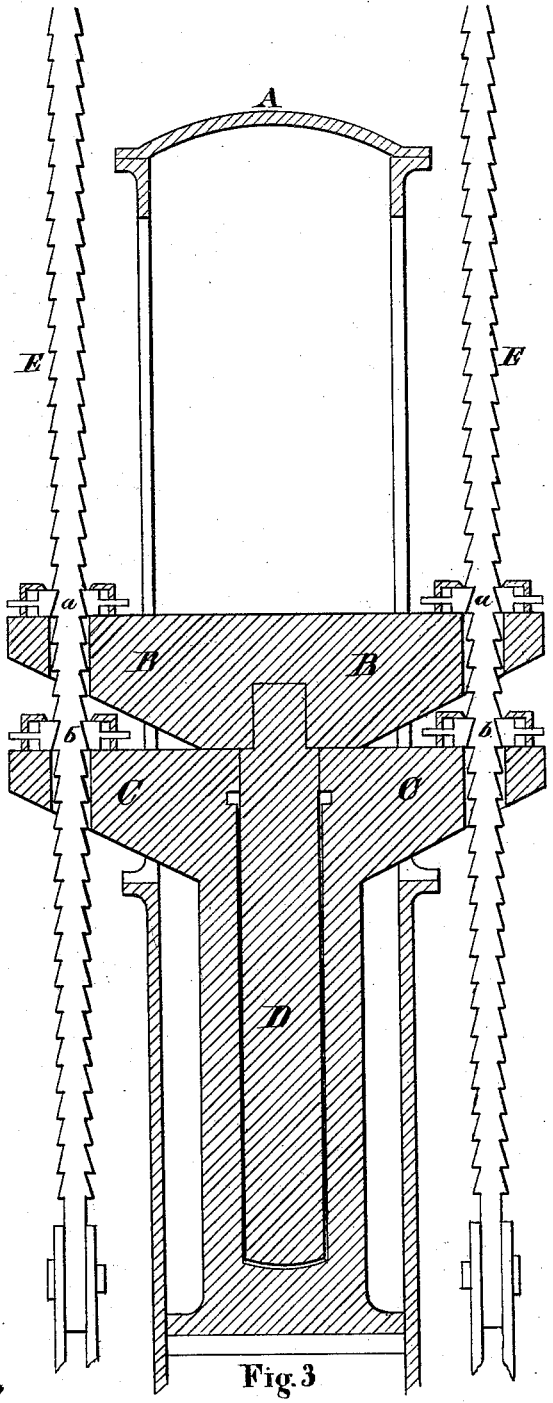

Fig. 3

Witnesses
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UNITED STATES PATENT OFFICE.

THEODORE A. BLAKE, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN HYDRAULIC-LIFT DRY-DOCKS.

Specification forming part of Letters Patent No. **168,603**, dated October 11, 1875; application filed July 27, 1875.

To all whom it may concern:

Be it known that I, THEODORE A. BLAKE, of the city and county of San Francisco, State of California, have invented a new and Improved Hydraulic-Lift Dry-Dock for the docking of vessels of any size; and that the following is a full and exact description of a dock with a capacity of raising a vessel of one thousand tons weight, involving in its construction the use of my invention, reference being had to the accompanying drawings and to letters of reference marked thereon.

The dock illustrated in the drawing consists of thirty-two cast-iron columns, (see Figure 1,) each twenty inches in diameter, arranged in two parallel rows, and sunk in a suitable depth of water, through the overlying material—mud, sand, or gravel, as the case may be—to the solid rock. The columns in each row are twelve feet apart from center to center, Fig. 1. Each column contains a hydraulic press, a section of which is shown by the sectional drawing, Fig. 3, six inches in diameter, and with two feet six inches stroke, supported on concrete, with which the interior of the column is filled. The top of each press is above high water. The ram D of each press carries a cross-head, B, from which is suspended, by means of descending rods E E, Figs. 2 and 3, one end of a girder, G, which extends across the dock to the corresponding column on the other side. There is thus a series of sixteen girders (or thirty-two, in case two girders are used to each pair of presses) extending across the dock. (See G, Figs. 1 and 2.) The girders may be of wood and iron combined, or of iron alone. On these girders, which are twelve feet apart from center to center, the keel and bilge-blocks are placed. They are lowered; the vessel to be docked is floated into position over them. The bilge-blocks, previously suitably packed, are drawn in to her sides, and the girders, with the vessel resting upon them, are raised by means of the hydraulic presses. The rods E E, Fig. 3, by which the girders are suspended, are ratcheted on the sides, and pass through the projecting arms C C from the top of the presses, and through the cross-head B of the ram D, and are held by the pawls *a a* and *b b* on the top of the cross-head, and on the projecting arms of the press. When the ram has made its stroke—in this case (2 ft. 6 in.) two feet six inches, or lifted the vessel two feet six inches—it is lowered to its former position, the girders, with the vessel resting upon them, in the meantime being supported by the pawls *b b* on the projecting arms of the press. Another upward stroke of the ram makes another lift of two feet six inches, and so the process goes on, and the vessel is raised to the desired height out of water.

The pawls may be operated by springs, by hand, or by gravity, or in any well-known manner.

Instead of having the sides of the suspending-rods E E ratcheted, the rods may be perforated with holes at suitable distances, and steel pins passing through them used instead of the pawls *a a* and *b b*.

The projecting arms C C may be dispensed with, and the suspending-rods E E pawled on top of timbers or iron girders capping the presses from end to end of the dock.

What I claim as my invention is—

1. The girders G and presses D, in combination with the ratcheted rods E and pawl-blocks *a a b b*, substantially as and for the purpose set forth.

2. In combination with the presses D, having a stroke shorter than the distance through which the vessel is to be raised, the ratcheted rods E, provided with pawls, the arms C upon the presses, and the cross-heads B, the whole constructed to operate substantially as and for the purpose herein described.

THEODORE A. BLAKE.

Witnesses:

GEO. H. STRONG,

C. M. RICHARDSON.