

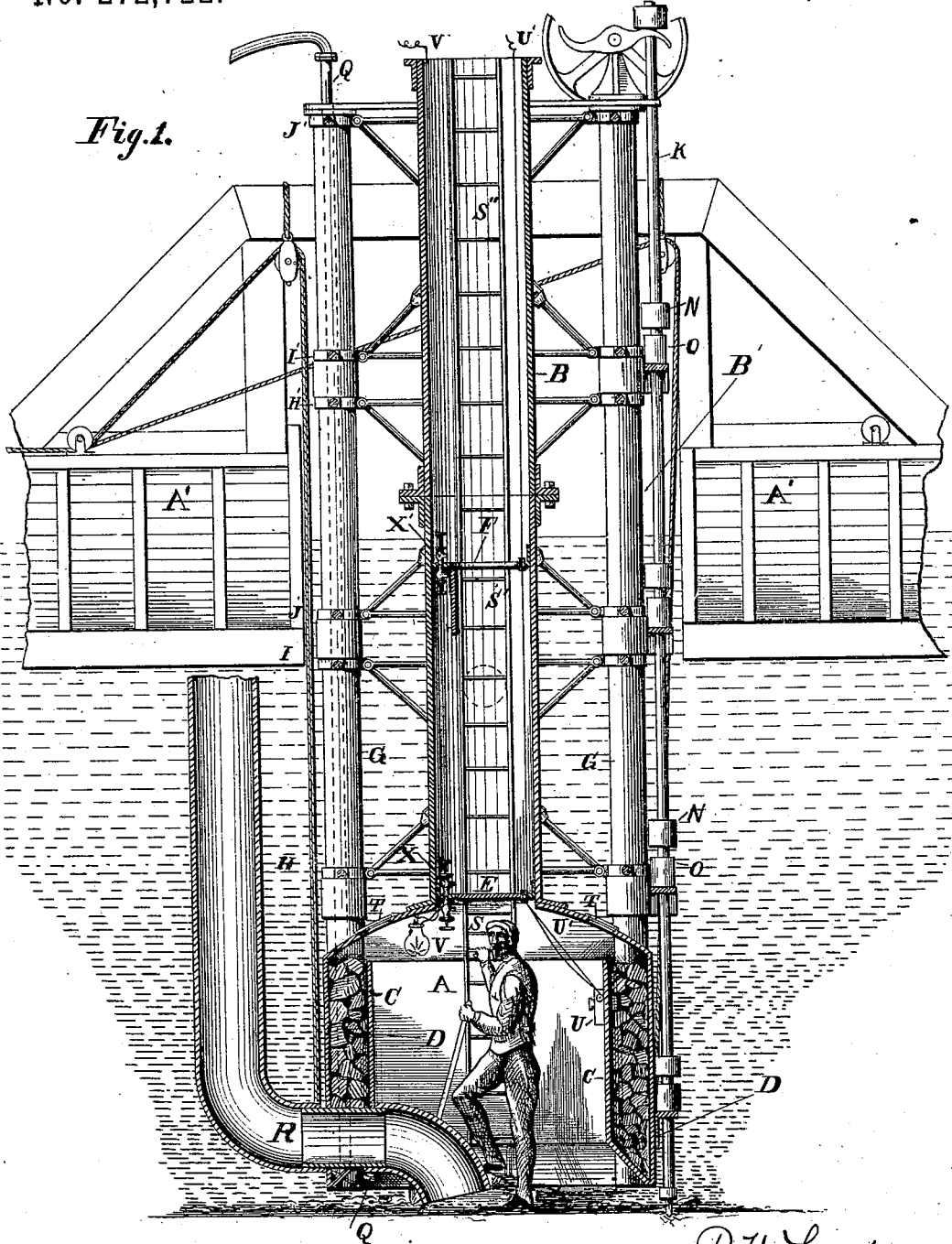
(No Model.)

3 Sheets—Sheet 1.

P. H. LOUD.
FLOATING CAISSON.

No. 272,722.

Patented Feb. 20, 1883.



WITNESSES:

M. Heubner,
John Diller

P. H. Loud
INVENTOR

By his Attorneys
W. C. Strawbridge,
Bonall Taylor

(No Model.)

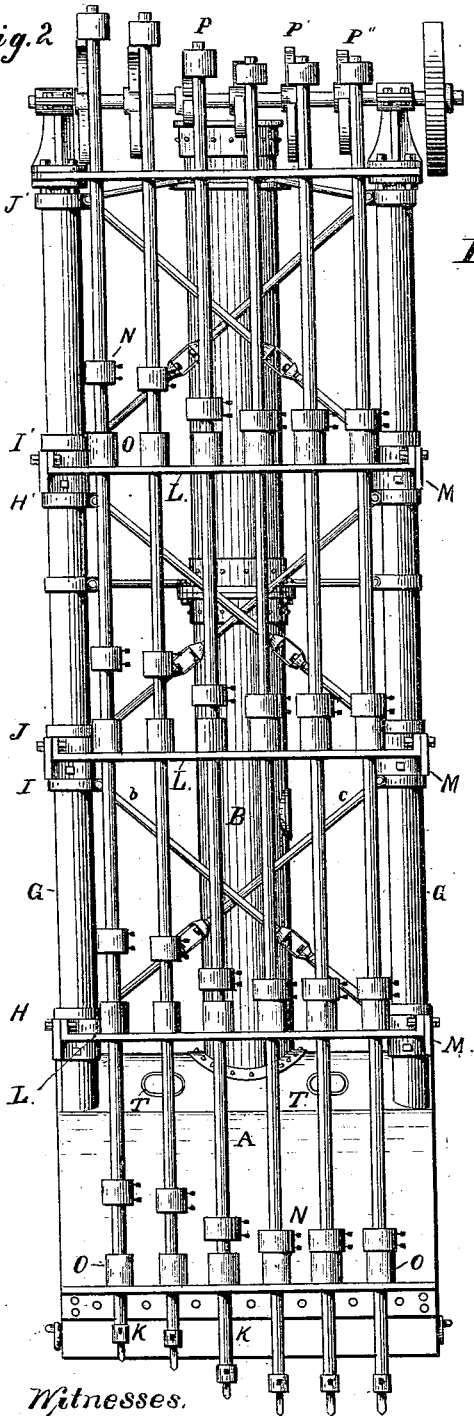
3 Sheets—Sheet 2.

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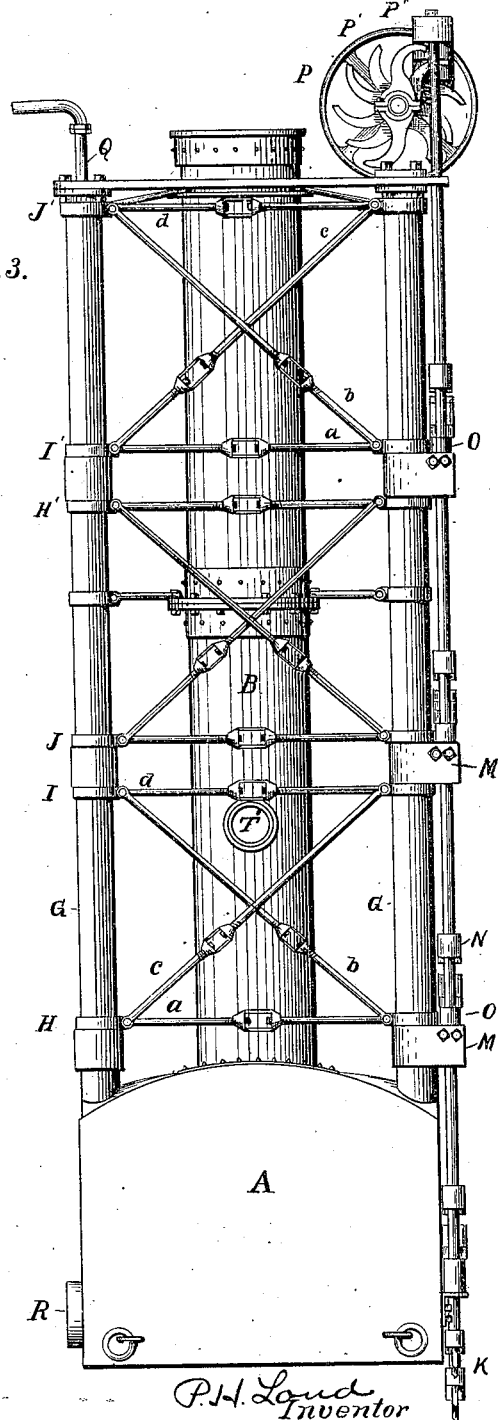
Fig. 2



Witnesses.

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Fig. 3.



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Fig. 4.

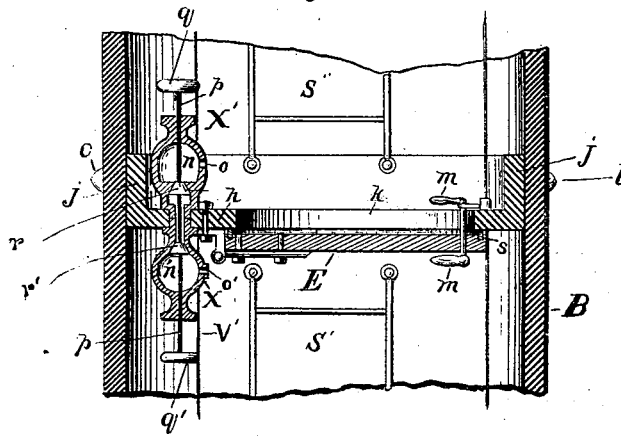
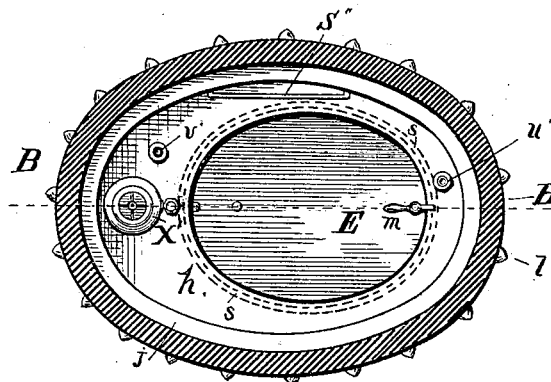


Fig. 5.



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UNITED STATES PATENT OFFICE.

PHILOLOGUS H. LOUD, OF WILLISTON, SOUTH CAROLINA, ASSIGNOR OF
ONE-HALF TO PHILOLOGUS H. LOUD, JR., OF SAME PLACE.

FLOATING CAISSON.

SPECIFICATION forming part of Letters Patent No. 272,722, dated February 20, 1883.

Application filed July 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, PHILOLOGUS H. LOUD, Williston, Barnwell county, State of South Carolina, have invented an Improvement in Floating Caissons, of which the following is a specification.

In the drawings, Figure 1 is a view, partly in side elevation and partly in sectional elevation, of my invention; Fig. 2, a view in side elevation of the side of my caisson to which the drills are applied; Fig. 3, another view in side elevation of said caisson; Fig. 4, a vertical central view, partly in section and partly in elevation, through the longer diameter of the central stack, B, of Fig. 1; and Fig. 5, a top plan view of the same.

In the drawings similar letters indicate like parts.

A is the air-chamber or caisson proper, constructed of boiler-iron or other suitable material, and having double walls C D, which form an annular chamber for the reception of stones or other heavy articles for the purpose of counteracting the buoyancy of the caisson, due to the air contained therein.

B is a central stack, attached to and springing from the chamber A, and communicating therewith by an opening having a downwardly-opening door, E. This stack is provided, intermediately of its length, with a second door, F, of like construction as the door E. The stack B is formed of iron or other suitable material, and is composed of any suitable number of sections, of cylindrical or other desired form, arranged end to end, one above another, and connected together by flanges and bolts, or by coupling-collars, or in such other manner as may be most convenient.

G G G G are pillars, columns, or tubes firmly attached to and springing from the corners of the chamber A. These pillars are formed in sections of any desired length, which sections are secured together by couplings of any suitable kind.

H I J and H' I' J' are collars mounted upon the pillars G G, to which collars are attached brace-rods *a b c d*, &c., which are provided with coupling-links for tightening the same, whereby the caisson-pillars and central stack are firmly and immovably bound together.

K K K are picks, drills, or stamps attached to one side of the frame-work of the caisson by being passed through bearings in bars L L, which bars are supported at their ends by being bolted to struts M M M, bent about and supported upon the pillars G G. The picks K K K being located upon the outside of the caisson, the rock or other material may be excavated and removed in such manner that the caisson will more readily and completely sink to the point at which the work is to be carried on.

N N are stops secured upon the picks K K K by clamping-screws, or in any suitable manner.

O O are rubber cushions, resting upon the guide-bars L L, for deadening the blow and limiting the downward movement of the picks.

P P' P'' are double cams, mounted upon the top of the caisson frame-work, and operated in any convenient manner to raise and drop the picks K K K for drilling or breaking rock or like substances.

Q is an iron pipe leading from the upper part of the caisson frame-work to a point in and near the bottom of the air-tight chamber A, and provided at its upper end with a hose or other proper attachment for connection with an air pump or compressor for the supply of air to said chamber A.

R is a suction pipe or hose extending into the caisson-chamber A, and having its lower extremity extending slightly below the lower edges of the sides thereof, and connected at its upper extremity with proper exhaust or suction apparatus.

The advantage of extending the pipe R to a point below the lower edges of the sides of the chamber A is that the lower end of said pipe is thereby immersed in the water below the working-chamber, with the result that the excavated and broken rock may be readily fed to said pipe and carried away with and by the exhaust stream of water caused to flow through the same.

S S' S'' are ladders secured to the inner surface of the stack B, and extending to the top thereof.

T T and T' are windows for supplying light to the caisson and to the central stack.

U is a telephone, and V an electric light, &c.

both located in the chamber A, and provided with connecting-wires U' V', respectively.

X X' are air-valves, by means of which atmospheric communication is made or broken between the compartments of the central stack and caisson above and below the doors E and F.

The construction and mode of operation of the doors E and F and of the valves X X' are shown in Figs. 4 and 5, in which *h* is a plate of the size and of the configuration of the interior cross-section of the stack B, and provided with a flange, *j*, and an opening or man-hole, *k*. This plate is secured within and to the stack B by means of bolts *l*. The door E is hinged at one extremity to said plate, and opens downward, and is provided at its opposite extremity with a suitable latch or device, *m*, to prevent it from falling open.

The valve X is double in its construction, and is composed of two chambers, *n n'*, located respectively above and below the door E, each chamber being provided with a vent, *o o'*. A valve-stem, *p*, extends through these chambers, and is, above and below the door E, provided with handles *q q'* and with valves *r r'*, opening simultaneously downward by a downward movement of the valve-stem, and simultaneously closing upward into valve-seats by the same instrumentality.

s is a ring of gutta-percha set into a groove formed around the periphery of the opening *k* in the under surface of the plate *h*. This ring forms a cushion, against which the door E closes, and by the compression of which an air-tight joint is produced.

Fig. 1 of the drawings shows a boat or float, A', of suitable construction, and provided with a well, B', of sufficient size to contain the caisson, the said caisson being suspended therein by means of ropes or chains attached to said caisson and passing over pulleys suspended from proper galleys or hog-braces built upon the boat, in such manner that the caisson may be raised or lowered, as may be found necessary.

From the foregoing description the mode of operation of my floating caisson will be readily understood. The double walls of the chamber A afford ready means for so loading the caisson as to cause it to sink in the water to the required depth. The chamber A is supplied with air under pressure through the pipe Q, whereby the water is excluded from said chamber when the caisson is in use. The excavated and broken rock or other material, produced by the drills or stamps K K, or by workmen working in the chamber A, becomes mingled with the stratum of water which ex-

ists below the lower edge of said chamber, and is, by means of the suction-pipe R, removed from said chamber and deposited in any suitable receptacle upon or attached to the boat.

When the caisson is in use and a workman desires to ascend from the chamber A through the stack B, it is necessary to first open the valve X to establish an equilibrium of atmospheric pressure in the chamber A and in the compartment of the stack above the door E. The door E may then be opened. After the workman has passed above said door it is closed and the valve X is closed. The valve X' is now opened to establish an equilibrium of pressure in the compartments above and below the door F. This door is then opened, and the workman passes above said door and closes the same, as well as the valve X'. In descending through the stack B to the chamber A, the same method of operating the doors and valves is pursued.

The simplicity, lightness, and cheapness of construction of my apparatus, its adaptability to quick and easy movement from place to place, and its efficiency for rapid and thorough work will be readily understood by those skilled in the art to which it appertains.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In combination, in a caisson, an air-tight working-chamber having an open-ended bottom, a compressed-air-supply tube opening into said chamber, and an exhaust-tube opening into said chamber at a point slightly below the lower edge of the same, as specified.

2. In combination, in a caisson, an air-tight working-chamber having an open bottom, a stack communicating with and leading from said chamber, two or more air-tight doors arranged at different points within said shaft, and air-valves communicating with the two adjacent compartments located and adapted to be operated upon each side of said doors, respectively, as specified.

3. In a caisson, an annular chamber formed of double walls C D, said chamber having an open top communicating with the interior of the working-chamber for the supply or removal of weighting material.

4. The combination, with the frame-work of a caisson and upon the outside of the same, of drills or stamps K K, for the purpose specified.

In testimony whereof I have hereunto signed my name this 10th day of July, A. D. 1882.

P. H. LOUD.

In presence of—

W. C. STRAWBRIDGE,
J. BONSALL TAYLOR.