

Alexey W. Von Schmidt's
Plan or Method for the
Removal of Sub-Marine Rocks

No. 119,902.

Fig. 1

Patented Oct. 10, 1871.

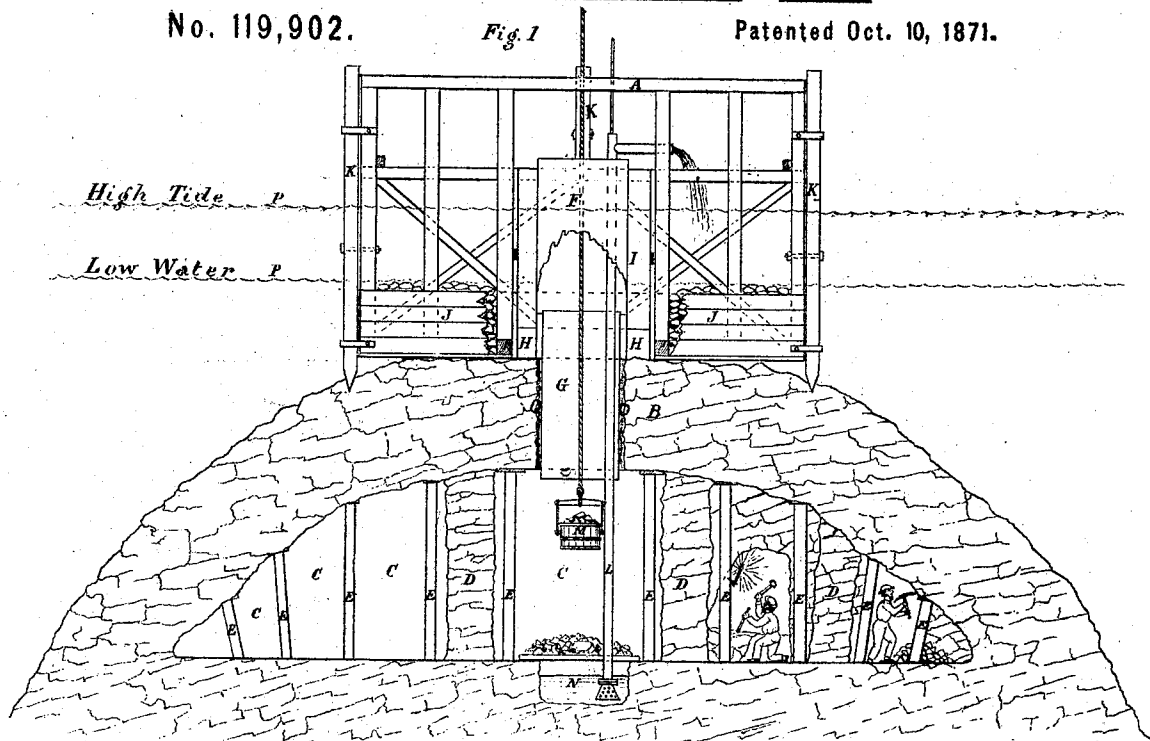
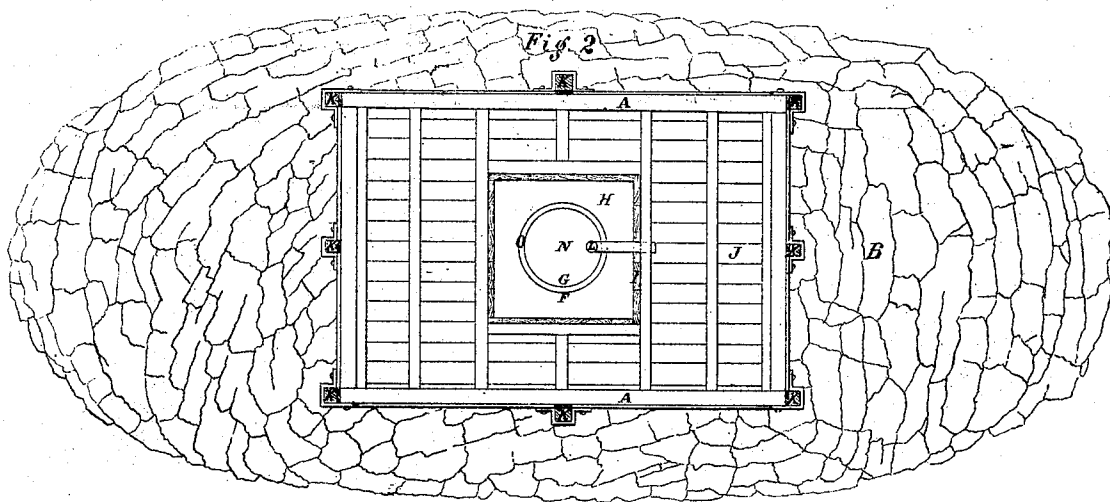


Fig. 2



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IMPROVEMENT IN METHODS OF REMOVING SUBMARINE ROCKS.

Specification forming part of Letters Patent No. 119,902, dated October 10, 1871.

To all whom it may concern:

Be it known that I, ALLEXEY W. VON SCHMIDT, of the city and county of San Francisco and State of California, have invented a new Mode or Method of Removing Submarine Rocks; and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawing, of which—

Figure 1 is a longitudinal section; Fig. 2, a top view or plan.

My invention consists in the mode and manner of entering and excavating dangerous submerged rocks from harbors or rivers by means of an iron or wooden turret or cylinder, and excavating the inside of the rock and removing the same therefrom, and excavating a chamber so large that it will contain the shell or outside portion of the rock when exploded with powder tamped with water, by which means a rock of any size can be removed and the required depth obtained.

Fig. 1, A represents the frame or skeleton coffer-dam. B represents the rock. C represents the cavity or chamber as excavated. D represents stone pillars supporting roof or outside casing of rock while excavating. E represents supports of wooden shores to sustain roof after stone pillars are removed. F represents the iron turret or cylinder through which access is obtained into the interior of the rock. G represents the inside turret or cylinder, which is placed so as to reach down into the rock as far as required to form a better and stronger connection with the rock. H represents pure hydraulic cement to exclude water from first turret F or cylinder. I represents the wooden coffer-dam to hold and retain cement. J represents scow-bottom of frame to hold stone ballast. K represents running piles shod with steel points to hold firmly in the rock. L represents the drainage-pumps and pipe. M represents the tub for hoisting rock from excavation. N represents the pump or drainage-well. O represents the cement between iron cylinder and rock. P represents the high and low-water lines.

To enable others skilled in the art to use my invention, mode, or manner of removing submarine rocks partially or wholly submerged, I will proceed to describe its construction and operation.

I construct a crib or frame-work of either wood or iron, of such size as may be required for the particular work to be done, as represented in the accompanying drawing, Figs. 1 and 2, A. This frame structure has a scow-bottom, as shown, Figs. 1 and 2, J, which enables me to float the structure over the rock. When in the proper position I fill the scow with water and stone ballast, which causes the whole structure to sink upon the rock, where it remains permanently fixed. The running piles, Figs. 1 and 2, K, shod with steel points, are run down upon the stone and firmly secured, with clamps or screw-bolts, to the main frame-work, which prevents the crib or frame-work from rocking from side to side. In the center of the frame or crib I construct a wall or coffer-dam, as shown, Figs. 1 and 2, I, of tongued-and-grooved plank to fit as close to the rock as may be. Inside of this coffer-dam I place a boiler-iron cylinder or turret, say six feet in diameter, (or any other diameter,) made of $\frac{1}{4}$ quarter-inch wrought-iron, and of such length as will reach from the surface of the rock above high-water mark, as represented, Fig. 1, F. Then I fill the space between the iron cylinder and coffer-dam with pure hydraulic cement. The cement will harden when under water in a short time, when a perfect connection is formed with the rock. I then free the cylinder from water by means of a pump. I then reach the surface of the rock, when I commence sinking down into the rock of the size of the cylinder, say twelve feet, when I place a second cylinder, as shown in Fig. 1, G, inside of the rock and running up into the cylinder F about four feet. This second cylinder G is four inches less in diameter than cylinder F. Into this space, between the cylinder and rock, I fill completely with pure hydraulic cement, which has the effect to close the space in a solid manner, and also to prevent any leakage from and near the surface of the rock. This having been completed, I next proceed to sink into the interior of the rock and make the necessary excavations in the same manner as is now done in ordinary mining. I first leave stone pillars, as shown, Fig. 1, D. When the rock is worked out I timber, as represented, Fig. 1, E, and remove the pillars, as shown, Fig. 1, C C C C. The stone is hoisted in a tub out of the interior by means of a steam-engine and through the iron cylinder, Fig. 1, F and G, and

deposited outside of frame in boats or otherwise. Fig. 1, N represents the pumps or well for the collection of seepage water, which is pumped out through pipe L. When all the rock is removed that may be required from the inside I place the necessary quantity of powder within the chamber. Having made the necessary electric connections I fill the entire chamber with water for a tamping. When the blast is set off the entire rock is broken in every direction, the shell unexcavated falls into the cellar or deep recess made to receive it, thus completing the entire removal of the rock.

I am aware that coffer-dams and cribs are not new in themselves, and do not wish to be understood as claiming them, my invention resting in the idea of accomplishing the removal of harbor obstructions by a plan or system composed of a series of steps, all of which are necessary to success; and such plan or system has never to my knowledge been either suggested or adopted.

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

1. The method of entering a rock partially or wholly submerged by means of a cylinder composed of suitable material and the connection therewith formed in the manner substantially as shown and described.

2. The method of removing the rock by forming therein a chamber or cavity of sufficient capacity to receive the shell thus formed, supporting said shell by stone pillars during the excavating process, afterward substituting for them wooden supports, charging the cavity with blasting agents, filling the cavity with water as a tamp, and then igniting the explosive agents, all substantially as herein fully described and shown.

ALLEXEY W. VON SCHMIDT.

Witnesses:

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