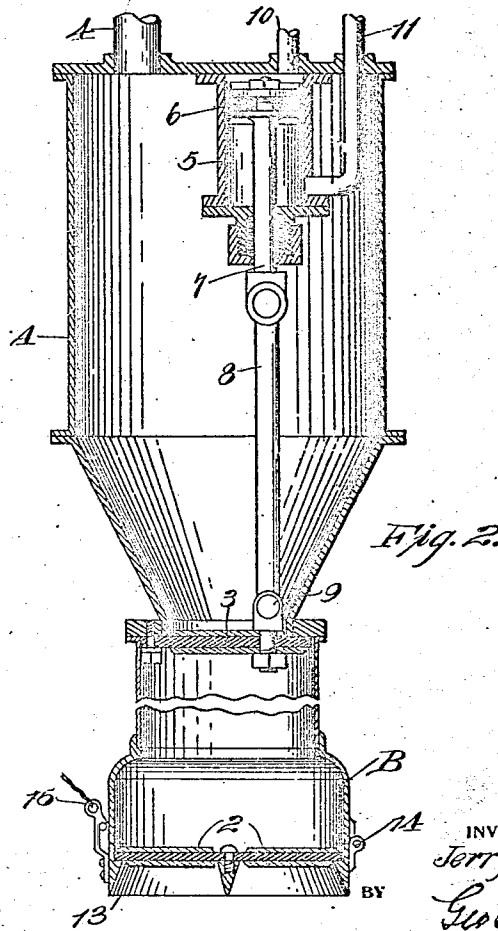
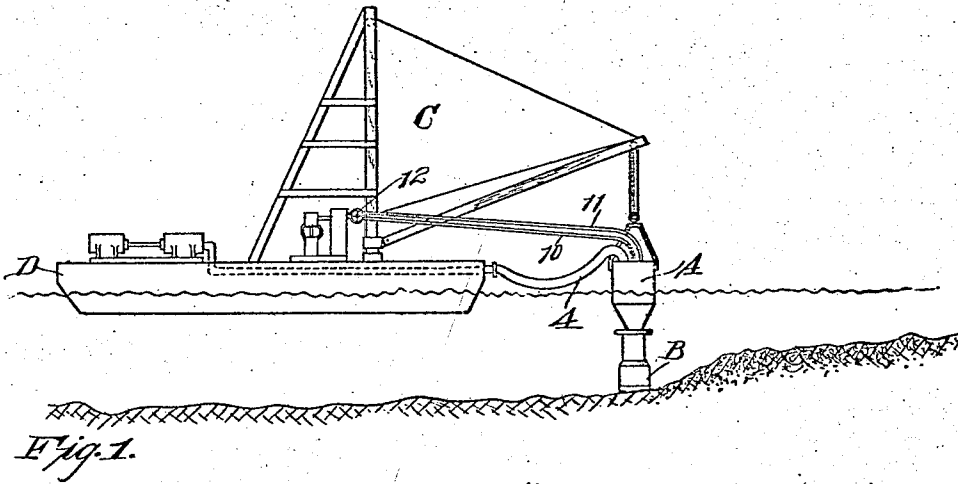


J. B. RIDDLE.
VACUUM MINING DEVICE.
APPLICATION FILED JUNE 15, 1908.

898,927.

Patented Sept. 15, 1908.



WITNESSES

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JERRY B. RIDDLE, OF SACRAMENTO, CALIFORNIA.

VACUUM MINING DEVICE.

No. 833,927.

Specification of Letters Patent.

Patented Sept. 15, 1908.

Application filed June 15, 1908. Serial No. 438,623.

To all whom it may concern:

Be it known that I, JERRY B. RIDDLE, citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented new and useful Improvements in Vacuum Mining Devices, of which the following is a specification.

My invention relates to a device which is designed for excavating and raising valuable sand and material from the bottoms of rivers, or other bodies of water where such sand may be found.

It consists in the combination of parts, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 shows the device applied. Fig. 2 is a central vertical section.

For the purpose of excavating and raising valuable gold-bearing sands from submerged positions, I employ a vacuum chamber A, and in connection therewith a sand-receiving chamber B extending downwardly from the first named chamber, and having inwardly opening valves 2 through which, when the lower end of the chamber B is in contact with the substance to be raised, this substance will be drawn in by pressure from the outside, caused by the vacuum above which pressure forces a charge of the material into the chamber B by opening the valves 2. These valves are again closed when the pressure is removed, and the load may be deposited in sluices or otherwise.

I have here shown the apparatus suspended from a crane or derrick C, which is mounted upon a float or scow D in such a manner that it may be raised and swung about from the point of excavation to the point of deposit; but it will be manifest that the apparatus may be operated in other ways without materially altering the character of my invention.

The vacuum chamber A is here shown as cylindrical in shape having the lower end made convergent and funnel-shaped to the point of junction with the upper end of the chamber B, and the two may be united by the usual bolts and flanges, or in other suitable manner.

3 is a valve hinged at the junction of the two chambers and closable upwardly.

The face of the valve is made of heavy rubber or elastic material, so that in case of small gravel, or other obstruction being lodged at

this point, such obstruction will sink into the material of the valve face to such an extent as to allow the valve to close substantially tight, when released.

The upper part of the chamber A is connected at 4, with a suction pipe which may be carried upon the float, or in suitable proximity with this apparatus.

5 is a cylinder having a piston 6 adapted to reciprocate within it. The piston-rod 7 of this cylinder is connected by a pitman 8, with the valve 3 as shown at 9, so that when the piston is forced down, the valve 3 will be opened downwardly and open communication effected between the chambers A and B. The vacuum having been produced in the chamber A, the exterior pressure will force a charge of material and water into the chamber B, and a portion of the water or material may arise into the chamber A. The chamber B having thus received its load, the valve 3 is closed by the upward movement of the piston 6, and the apparatus may then be raised and turned to a position where the load may be deposited. This disposition of the load is effected by opening the valves at the bottom of the chamber B, and also the valve 3 so that the vacuum in the chambers having been destroyed the load will sweep out of the two chambers.

The conical form of the lower part of the chamber A is favorable to the washing out of any material which may have been carried upward into this chamber, and the valves being closed, the apparatus being again swung into position, the vacuum is again produced in the chamber A, the opening of the valve 3 will again cause another load to be again drawn into the chamber B.

The piston 6 is reciprocated by any suitable fluid pressure introduced alternately through the pipes 10 and 11; one connecting with the upper part of the cylinder 5, and the other with the lower part. By means of a three way cock 12, or equivalent valve, one of these passages may be opened for pressure, and the other connected with an exhaust passage to allow the fluid upon the opposite side of the piston to freely escape, and not cause back pressure; the operation being in this particular similar to that of any reciprocating engine.

The valves or gates 2 are here shown as being mounted in the bottom or base which is hinged to the lower part of the cham-

ber B, as shown at 14. This bottom, when closed, is retained in position by a latch 15, and this is its condition when the apparatus is lowered upon the sand or material to be raised, and when pressure from the exterior is allowed to act upon the sand by the opening of the valve 3, so that the vacuum in the upper chamber may act through the lower one, the gates 2 will open as previously described. After the apparatus, thus filled, has been transferred to a point of deposit, the whole of the bottom 13 is released by disengaging the latch 15, thus allowing it to swing around its hinge 14 and discharge the load.

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

1. In an apparatus of the character described, a vacuum chamber, a material receiving chamber connected therewith, an upwardly closing valve located between the chambers, and mechanical means whereby said valve is positively opened.

2. In an apparatus of the character described, a vacuum chamber, a material receiving chamber having inwardly opening valves or gates, a valve located between the two chambers, a cylinder with reciprocating piston and rod, and connections between said piston-rod and the valve whereby the latter may be opened.

3. In an apparatus of the character described, a vacuum chamber superposed upon a material-receiving chamber, an upwardly closing valve located between the chambers, means for producing a vacuum in the upper chamber, mechanical means by which the valve may be opened against the upward

pressure, and automatically operating gates in the lower part of the receiving chamber.

4. In an apparatus of the character described, a vacuum chamber superposed upon a material-receiving chamber, said vacuum chamber having a funnel-shaped bottom connecting with a reduced passage between the two chambers, an upwardly closing valve located in said reduced portion, inwardly opening valves or gates located in the lower chamber, means by which a vacuum is produced in the upper chamber, controllable means by which the intermediate valve is opened to allow the vacuum pressure to act within the lower chamber, means for raising and transferring the apparatus to a point of deposit, and means for releasing the vacuum and allowing the material to be discharged.

5. In an apparatus of the character described, a vacuum chamber, a material-receiving chamber connected therewith, an intermediate upwardly closing valve, means for producing a vacuum in the upper chamber, mechanical means by which the intermediate valve may be opened to allow the vacuum to act in the lower chamber, inwardly opening valves or gates in said lower chamber, a hinged bottom upon which said valves are located, a latch by which said bottom is normally closed, the releasing of said latch allowing the entire bottom to swing open.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JERRY B. RIDDLE.

Witnesses:

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CHARLES EDELMAN.