J. T. REA.

WELL SINKING APPARATUS.

APPLICATION FILED NOV. 18, 1908.

952,636. Patented Mar. 22, 1910.

Fig. 1

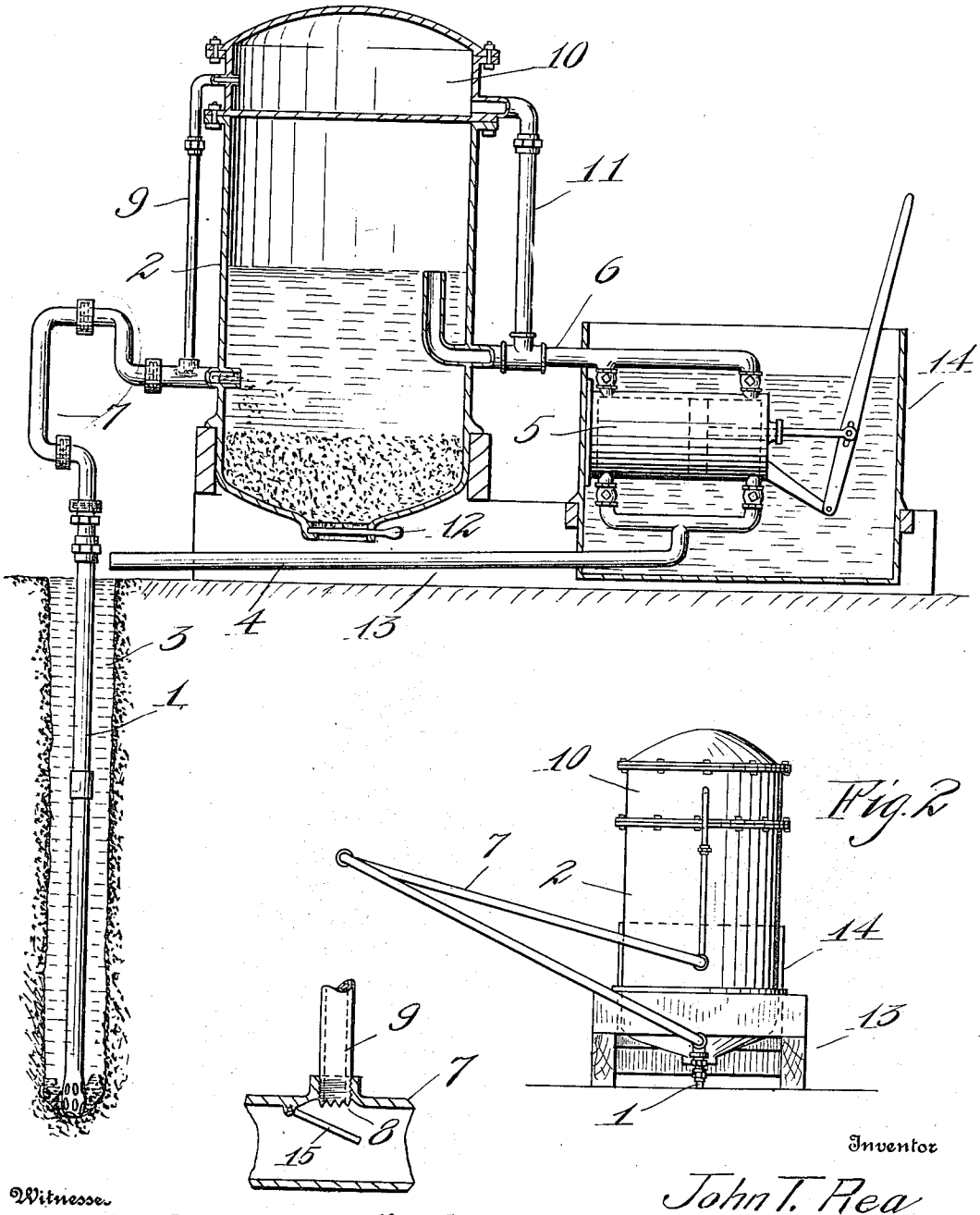

Fig. 2

Fig. 3

Witnesses.

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WELL-SINKING APPARATUS.

952,636. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed November 18, 1908. Serial No. 463,295.

To all whom it may concern:

Be it known that I, JOHN T. REA, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Well-Sinking Apparatus, of which the following is a specification.

My invention relates to apparatus of the above type and aims primarily to provide an apparatus through the medium of which wells can be sunk in an efficient manner and with rapidity, thereby adapting the invention also for use in prospecting.

An essential object of my invention resides in providing a structure in which air is extracted from the rising column of excavated material prior to the discharge of the latter into the settling chamber, thereby enabling a substantial vacuum being maintained in said chamber.

Other objects will be set forth as the description progresses and those features of construction, arrangements and combinations of parts, in which my invention resides, succinctly defined in my annexed claims.

Referring now to the accompanying drawing wherein my invention in such form as now preferred by me, is illustrated: Figure 1 is a vertical sectional view showing my apparatus in operation. Fig. 2 is an end elevation thereof, and Fig. 3 is a detail sectional view, on enlarged scale, illustrating more particularly my guard means which prevents the excavated material being drawn with the air through the branch pipe or conduit.

In carrying out my invention I provide a sinking or drill tube 1 through which the excavating material is carried with water to the settling chamber 2, the water being supplied into the well 3 about tube 1 by a pipe 4 which is connected with a pump 5, preferably of the double acting type.

Reference numeral 6 indicates a pipe leading into settling chamber 2 and communicating with the inlet ports of pump 5 whereby upon operation of the pump suction will be created in chamber 2 to maintain a vacuum therein and to effect the removal of water when it rises above the level indicated in Fig. 1.

Reference numeral 7 indicates a flexible connection between tube 1 and chamber 2, the same establishing communication therebetween while permitting of proper manipulation of tube 1 during the process of sinking the well, and the addition of lengths or sections to tube 1, as is well understood.

In the present invention I aim to free the rising column of water and excavating material of any air that might be contained therein, prior to the discharge of said column into chamber 2, thereby enabling me to maintain a more perfect vacuum in chamber 2 which obviously greatly facilitates the work. The means now employed by me for effecting this aim includes means for producing suction in the flexible connection 7, said connection being vented as at 8, with which vent a branch pipe 9 of relatively small cross sectional area communicates. (See Fig. 3.) Pipe 9 leads to a vacuum chamber 10, in which suction is created in any desired manner. A simple arrangement consists in connecting said chamber 10 by a pipe, as 11, with the suction pipe 6 of the pump. In the present embodiment of my invention, chamber 10 is arranged on and secured to the upper end portion of the settling chamber 2 and forms a closure therefor. This construction, however, can obviously be changed and likewise a pump of other suitable construction can be readily substituted for that shown.

When desired, material can be discharged from chamber 2 through the gate 12.

Chamber 2 is supported in any desired manner as for example on a stand 13, the same also conveniently providing a support for a tank 14 in which pump 5 is submerged.

Reference numeral 15 indicates a guard swingingly supported beneath vent 8, as shown, so as to prevent dirt or other foreign matter traveling through conduit 9.

Chamber 10 by reason of guard 15, receives nothing but air and water. The coarse material goes to settling chamber 2. By having the coarse material forwarded to chamber 2, wherein suction is created, although such suction be great, only a partial vacuum is secured, owing to the air that is thrown off from the material itself as it disintegrates. While it might appear that air would equalize in the two chambers, yet it must be remembered, first, that the air rising in the main suction pipe will seek its first release, which is through pipe 9 to the upper chamber, while the material owing to

the guard 15 passes on into chamber 2, carrying the air that is present in the dense material, and second, that the suction in chamber 2 is such that the air instead of pressing back to equalize the upper chamber through branch pipe 9, finds a readier means of escape by way of the pump, and for that reason does not tend to equalize the upper chamber but leaves it free to act by itself, thus sustaining the vacuum pressure of that chamber independently of the lower chamber.

The term "drill tube" as herein used is intended to cover a tube of any desired form or type which can be employed in conjunction with the remainder of the apparatus to provide a passage-way for material drawn or sucked through the lower end portion thereof.

My apparatus while being particularly adapted for sinking wells will operate in an efficient manner in submarine dredging.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States of America, is:

1. An apparatus of the character described comprising a closed settling chamber, a drill tube, means establishing communication between said settling chamber and said drill tube, a pump connected with said settling chamber to create suction therein, and means communicating with said first means exteriorly of said settling chamber for conducting air therefrom.

2. In an apparatus of the character described, a settling chamber, a drill tube, means connecting said drill tube for communication with said settling chamber, and means for creating suction in said first means to effect the removal of air from the material prior to the delivery of the latter into said settling chamber.

3. An apparatus of the character described comprising a closed settling chamber, a drill tube in communication therewith, means for creating suction in said settling chamber, whereby material loosened by said drill tube will be drawn thereinto, and means for effecting the removal of air from the column of material thus drawn upwardly prior to its discharge into said settling chamber.

4. An apparatus of the character described comprising a closed settling chamber, a drill tube, means establishing communication between said settling chamber and said drill tube, a pump connected with said settling chamber to create suction therein, and a vacuum means communicating with said first means between said drill tube and said settling chamber.

5. An apparatus of the character described comprising a settling chamber, a drill tube, a pipe leading from said drill tube to said settling chamber, and pumping means connected for creating suction in said chamber and directly in said pipe intermediate said drill tube and the point of discharge into said chamber.

6. An apparatus of the character described comprising a settling chamber, a second chamber, a drill tube, means leading from said drill tube and establishing communication with both of said chambers, and means for creating suction in both of said chambers.

7. An apparatus of the character described comprising a settling chamber, a second chamber, a drill tube, means leading from said drill tube and establishing communication with both of said chambers, a guard arranged to prevent dirt entering said second named chamber, and means for creating suction in both of said chambers.

8. An apparatus of the character described comprising a settling chamber, a second chamber, a drill tube, a pipe leading from said drill tube to said settling chamber, a branch pipe leading from said first named pipe to said second named chamber, means for creating suction in both of said chambers, and means for conveying water for discharge into the well outside of said drill tube.

9. An apparatus of the character described comprising a settling chamber, means for creating suction therein, a tube through which the material is drawn, said tube being connected to said chamber, and means arranged to create suction in the material drawn upwardly to relieve the same of air prior to the discharge of said material into said settling chamber.

Signed at Seattle, Washington, this 7th day of November 1908.

JOHN T. REA.

Witnesses:
FRANK E. ADAMS,
JAMES A. LEWIS.