

No. 624,957.

Patented May 16, 1899.

L. H. MITCHELL.
TANK BOTTOM DISCHARGE DOOR.

(Application filed Nov. 26, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

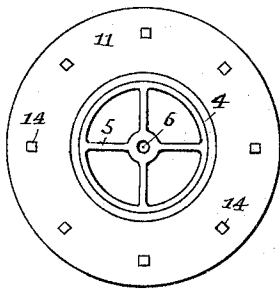
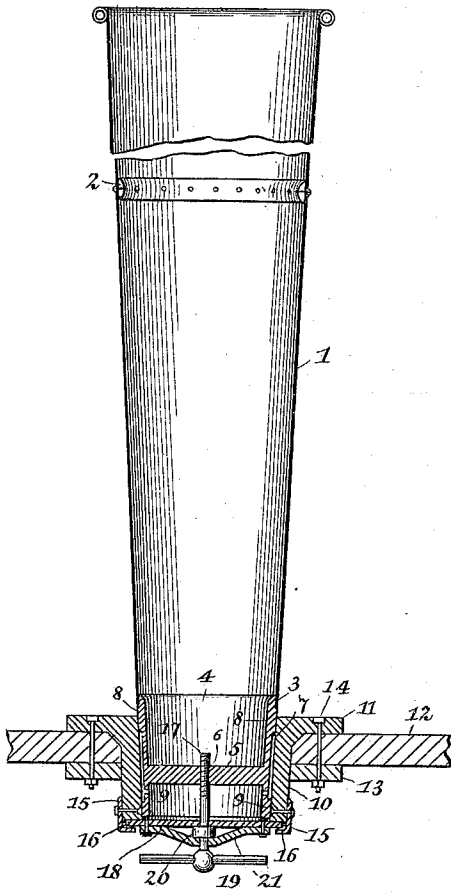


Fig. 2.

Witnesses:
E. B. Rolton
Charles S. Rogers

Fig. 3.

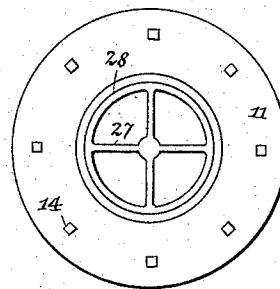
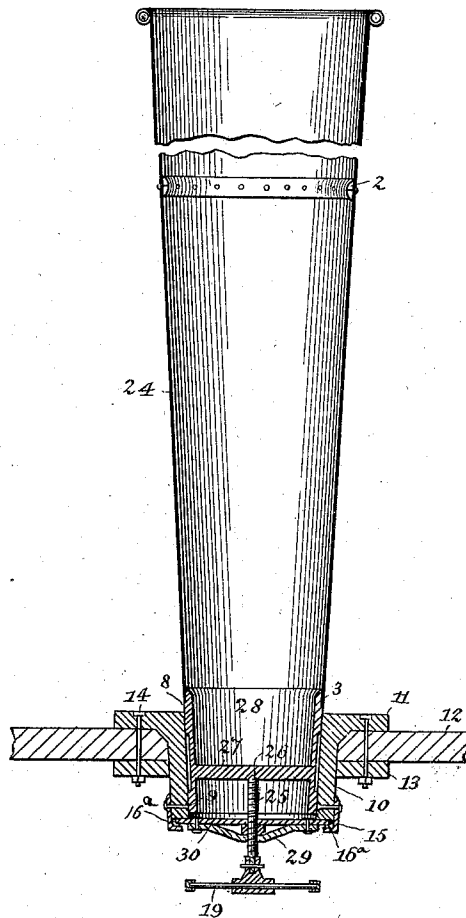


Fig. 4.

Inventor:
Lebbeus H. Mitchell
By James R. Rogers
his Attorney

No. 624,957.

Patented May 16, 1899.

L. H. MITCHELL.
TANK BOTTOM DISCHARGE DOOR.

(Application filed Nov. 26, 1897.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 5.

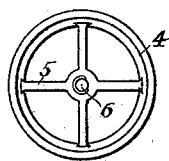


Fig. 6.

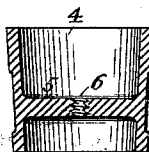


Fig. 7.

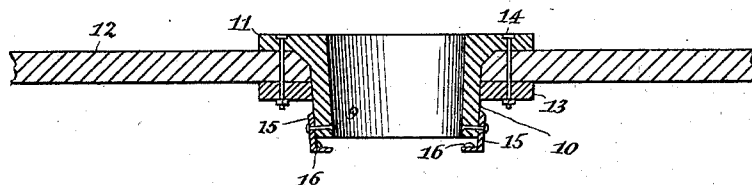


Fig. 9.

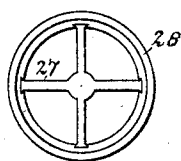


Fig. 10.

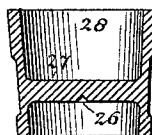
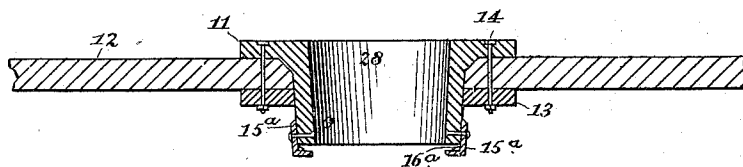


Fig. 8.



Witnesses:

E. R. Kotton
Charles S. Rogers

Inventor:
Lebbens H. Mitchell

By *James R. Rogers*
his Attorney.

UNITED STATES PATENT OFFICE.

LEBBEUS H. MITCHELL, OF SALT LAKE CITY, UTAH.

TANK-BOTTOM DISCHARGE-DOOR.

SPECIFICATION forming part of Letters Patent No. 624,957, dated May 16, 1899.

Application filed November 26, 1897. Serial No. 659,751. (No model.)

To all whom it may concern:

Be it known that I, LEBBEUS H. MITCHELL, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Tank-Bottom Discharge-Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in settling or settling and leaching tanks or vats designed to be used in case either of the settling from liquid, pulp, or sands or pulverized ores to be leached or, on the other hand, in the leaching of sands or pulverized ores, either settled or dry-crushed, in which latter case no settling is required, and it is also designed to be used in the treatment of gold and silver ores in the case where a leaching process by means of solutions of cyanid of potassium or otherwise is employed, and particularly to bottom discharge-doors for such tanks or vats; and some of the objects of the invention are to cheapen and facilitate the removal of sands, slimes, and residues from tanks or vats of any required dimensions; and with these and other objects in view the invention consists in the construction, combination, and arrangement of parts, as hereinafter described in the following specification and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a portion of a settling or settling and leaching tank embodying my improvements. Fig. 2 is a top plan view of the same with funnel removed. Fig. 3 is a view similar to Fig. 1 of a modified form of construction. Fig. 4 is a top plan view of the construction illustrated in Fig. 3, with the funnel removed. Figs. 5 and 6 are respectively plan and sectional views of the base shown in Fig. 1. Figs. 7 and 8 are sectional views through the bottom of the tank, showing the different position of the lugs; and Figs. 9 and 10 are respectively plan and sectional views of the base shown in Fig. 3.

Similar characters of reference designate like parts throughout the several views.

Referring to the drawings, and particularly to Figs. 1, 2, 5, 6, and 7 thereof, the reference

character 1 designates a funnel or similar device forming part of a settling or settling and leaching tank or vat, preferably constructed of sheet metal or suitable material in the general form of an inverted hollow conical frustum, which may be strengthened by means of flat or oval metallic or other hoops 2, and, if desired, the funnel 1 may be made cylindrical in form, and it can be of any desired length, and connected to the end 3 of the funnel 1 in any suitable manner is a frusto-conical base 4, of cast iron or steel, having an intermediate interior spider or diaphragm 5, provided with a central screw-threaded opening 6, and the base 4 is preferably cut away upon the exterior thereof, forming an annular channel-recess 7 to act as an air-space, and the exterior surfaces 8 and 9 above and below the recess 7, respectively, are planished or smoothed evenly, so as to fit with perfect accuracy within the frusto-conical casting or step 10, provided with a similarly-prepared interior surface.

The casting 10 is preferably provided with an upper annular exterior flange or rim 11, adapted to rest upon suitable timbers 12, beneath which and encircling the casting is secured a cast, wrought, or other ring 13, said parts being securely retained in position by means of bolts or other devices 14, as clearly shown in Figs. 1 and 7 of the drawings, and the casting 10 is preferably provided with two or more clips 15, carrying lugs 16, adapted to facilitate the centering of the screw 17 in relation to the spider or diaphragm 5, as will be hereinafter explained.

A cross bar or plate 18 is adapted to be secured across the bottom of the casting 10 by means of the clip 15, and mounted in the cross-bar is a screw 17, adapted to enter the opening 6 in the spider or diaphragm 5, and, if desired, the screw 17 may be provided with a hand wheel or lever 19 to operate the same, and the screw is preferably provided with a nut 20, located between the cross-bar 18 and a strip or plate 21, so that by turning said screw in one direction the base 4, with the funnel 1 attached thereto, may be raised up in the casting 10 and at the same time be released from the screw; but in the case of tanks or vats for leaching alone the screw 25, Fig. 3, simply bears against the central concavity 26,

formed in the spider or diaphragm 27, Figs. 3 and 4, of the base 28 to keep the screw in place, and when the screw 25 is turned in the nut 29, attached firmly to the cross-bar 30, the base 28 and attached funnel 24 are elevated, as hereinbefore stated.

In case of settling-tanks the lugs 16, carried by the clips 15 to facilitate centering the screw, are arranged on opposite sides—that is to say, one in the front and the other in the back; but in the case of leaching tanks the lugs 16^a are placed both on the back sides of the clip-seats 15^a.

The inner surface of the casting or step 15 is preferably planished perfectly true and smooth, as is also the outer surface of the base, and after the outer surface of the base has been turned to match the inner surface of the casting it is turned intermediately of its length to a depth of about an eighth of an inch to afford an air-space between it and the casting to prevent undue suction. Hence the bearings when the base and casting are in contact consist of two circular rings or zones 25 with an intermediate air-space, and the depth of these bearings may be regulated by actual experiments.

The inclination or slope of the sides of the base 4 and casting 10 can be regulated in practice, and it will be understood that the flatter the slope or less the inclination the less suction there will be between the parts, and the funnel may be of different inclination from the base and casting—that is, it may be of less inclination, but not greater.

An oval-shaped sheet-iron or other cover (not shown) may be employed during the time of filling to prevent any material accidentally falling into the funnel.

It will be observed that in this system of discharge-doors the funnel, with its attached base, forms a speaking-tube as between the truckmen below and the tankmen above and that it also acts as a ventilator.

To prevent rust and any tendency to leakage, the bearing rings or zones 8 and 9 and the interior surface of the casting 10 may be smeared with tallow or rubbed with oil.

The operation of the apparatus will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following explanation thereof.

The bearing rings or zones 8 and 9 of the base and the interior surface of the casting 10 are washed clean and then greased or oiled, whereupon the base, with the attached funnel, is then let into the casting and drawn down and held tight by means of the hand wheel or lever of the screw, thereby preventing any yielding of the base and attached funnel to the upward pressure of the water, with which the tank is first filled, and also preventing any flow or leakage which might otherwise occur. When the operation of settling or settling and leaching is concluded, the

hand wheel or lever of the screw is turned in a reverse direction, thereby forcing the base 4 and attached funnel perpendicularly upward and off the screw, whence it is lifted out by hand or withdrawn by means of tackle above, and the withdrawal may be done quickly or gradually if the nature of the sands or residues so require.

By means of the construction hereinbefore described it will be seen that there can be no dripping of water or solution during the process of settling or leaching, nor yet when the doors are opened by the withdrawal of the base and the attached funnel for the discharge of the sands or residues, and all of the foregoing advantages are attained by this apparatus, which embodies at the same time simplicity of form, cheapness, safety, and effectiveness of operation.

With these discharge-doors the actual removal of sands or residues can be commenced immediately the order to discharge is given, while in the case of seep-tanks from one-half to three-quarters of an hour is now required to dig from top to bottom before the actual discharge commences. Therefore from one-quarter to one-third of the time usually employed in emptying a tank will be saved.

I do not desire to confine myself to the specific construction herein described and shown and therefore reserve the right to make all such changes in and alterations of the same as will come within the spirit and scope of my invention.

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

1. A discharge apparatus for tanks provided with a hollow upper portion, a base attached thereto within the lower end thereof and provided with a spider or diaphragm, a casting adapted to receive said base and means below the casting coöperating with said spider and supported by said casting for disengaging said base and upper portion from said casting.

2. A discharge apparatus for tanks provided with a hollow portion, a frusto-conical base having integral bearing-zones connected thereto within the lower end thereof and a frusto-conical casting adapted to receive said base and carrying means for unseating the same.

3. A discharge apparatus for tanks provided with a hollow frusto-conical portion, a frusto-conical base attached thereto within the lower end thereof and provided with a spider or diaphragm, a frusto-conical casting adapted to receive said base and means coöperating with said spider or diaphragm below said casting to unseat said base.

4. A discharge apparatus for tanks provided with a hollow upper portion, a frusto-conical base attached to the lower end thereof and having a spider or diaphragm, a frusto-conical casting adapted to receive said base, a cross-bar carrying a screw adapted to op-

erate with said spider to unseat said base and means for supporting said cross-bar.

5. A discharge apparatus for tanks provided with a hollow upper portion, a frusto-conical base attached to one end thereof and having a spider or diaphragm, a frusto-conical casting adapted to receive said base, a cross-bar carrying a screw adapted to operate with said spider to unseat said base and clips carried by said casting to support said cross-bar.

6. A discharge apparatus for tanks provided with a hollow upper portion, a frusto-conical base attached to one end thereof, and having a spider or diaphragm, a frusto-conical casting adapted to receive said base, a cross-bar carrying a screw adapted to operate with said spider to unseat said base, clips carried by said casting to support said cross-

bar and lugs upon said clips to effect the adjustment of the screw.

7. A discharge apparatus for tanks provided with a hollow upper portion, a base having integral bearing-zones connected thereto at one end thereof, a casting having an upper annular supporting-rim and adapted to receive said bearing-zones, a ring surrounding said casting, devices connecting said rim and ring to secure the casting in position, and means supported by said casting to unseat said base.

In testimony whereof I affix my signature in presence of two witnesses.

LEBBEUS H. MITCHELL.

Witnesses:

PAUL F. BONORDEN,
ALWYN K. SHURTLEFF.