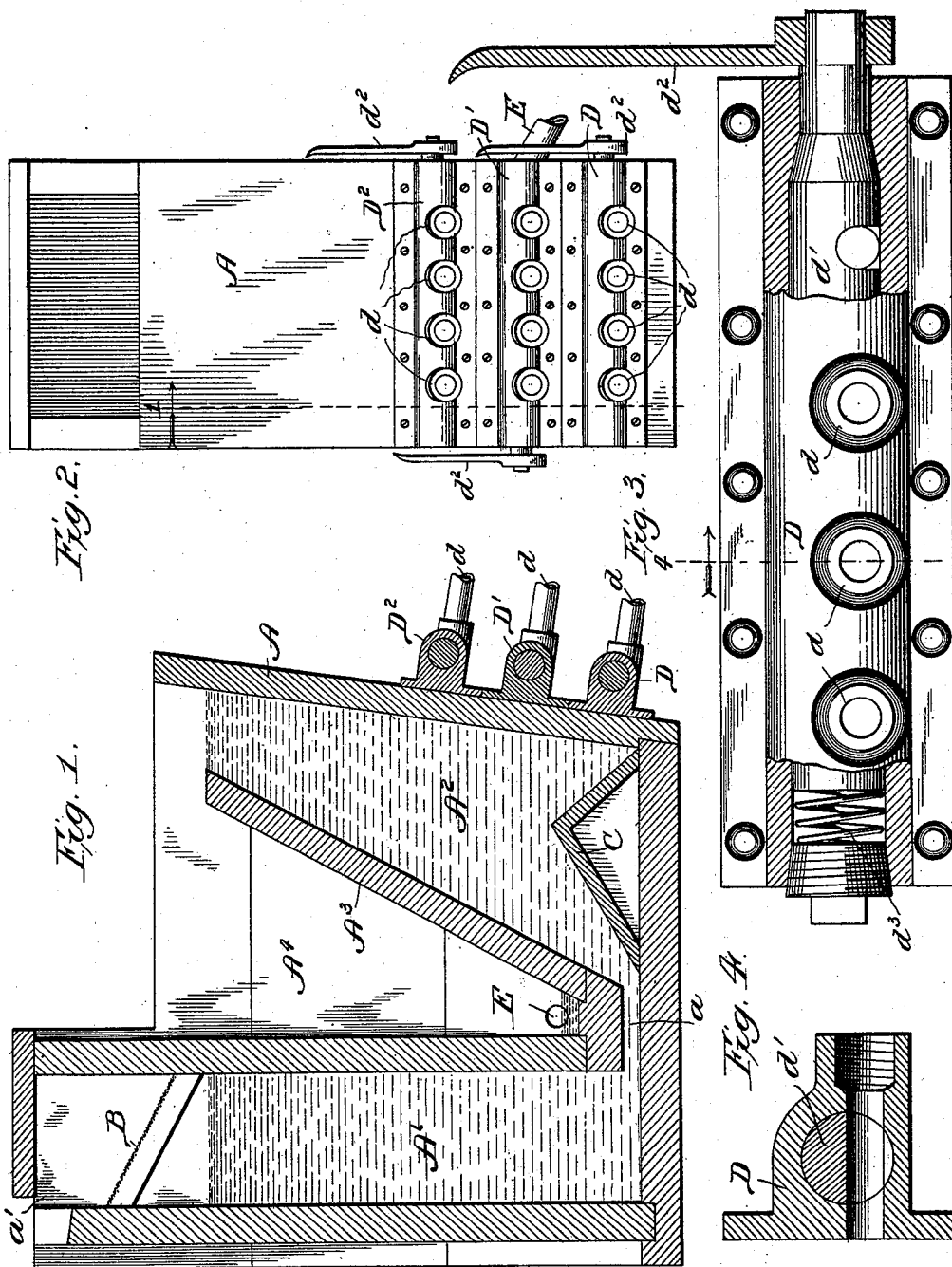


F. W. SHERMAN.
ORE PULP DISTRIBUTER.

(Application filed Mar. 3, 1900.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERIC W. SHERMAN, OF PARK CITY, UTAH, ASSIGNOR TO THE GATES IRON WORKS, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ORE-PULP DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 695,654, dated March 18, 1902.

Application filed March 3, 1900. Serial No. 7,182. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC W. SHERMAN, a citizen of the United States, residing at Park City, in the county of Summit and State of Utah, have invented certain new and useful Improvements in Ore-Pulp Distributers, of which the following is a specification.

My invention relates to that class of distributers and classifiers which are used in combination with ore stamps or crushers in which the material is crushed by the wet process into what is known as a "pulp" for the purpose of classifying and distributing the pulp.

15 The principal object of my invention is to provide a simple, economical, and efficient pulp classifier and distributer.

Other objects of the invention will appear from an inspection of the drawings and the following description and claims.

20 The invention consists in the features, combinations, and details of construction herein-after described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of an apparatus constructed in accordance with my improvements, taken at or about the longitudinal center of the apparatus; Fig. 2, an end elevation of the same looking at it from the right of Fig. 1; Fig. 3, an enlarged view, partly in section, showing one of the multiple discharge-valves; and Fig. 4, a transverse sectional elevation taken on line 4 of Fig. 3.

It is well known to those skilled in the art of milling precious ores, &c., that after the ore has been crushed through stamp-mills and other machines using the wet process the pulp which issues from such machines is in most cases passed on to a series of concentrators. In almost every instance it is desirable that this pulp, which is the water and comminuted sand and ore mixed together, should be classified, so that the different classes or sizes of pulp may be separated and distributed to different concentrators intended for that class.

This invention therefore has for its principal object the providing of a machine which will economically classify and distribute the pulp.

In illustrating and describing my mechan-

ism I have only thought it necessary to describe the classifier and distributer, as the other mechanism, such as the stamp-mills and concentrators, is well known to those skilled in the art and needs no illustration or description here.

In making a classifier and distributer in accordance with my improvements I use a receptacle A of the desired size and shape, in which there are two compartments known as the "pressure-chamber" A' and "settling" or "sizing" chamber A², connected together at the lower part thereof by means of a narrow channel a. The upper part of the pressure-chamber A' is provided with a supply-opening a', underneath which is arranged an inclined screen B of suitable size and mesh to prevent solid matter from entering the box and choking the small connecting-passage. The pulp is fed into the pressure-chamber at the opening a', so as to first contact the screen, which removes the solid matter and prevents it from entering the box, so that the fine pulp enters the pressure-chamber and from thence passes into the sizing-chamber. In order to prevent or break up the eddy so as to allow the material to settle in the sizing-chamber and be properly classified, an inclined baffle-board C is provided, which prevents direct current and allows the pulp to easily enter the sizing-chamber, from which it is withdrawn.

It will be understood that owing to the different sizes and specific gravity of the material forming the "pulp" it will settle in layers, and in order to properly classify this I provide outlets arranged in different horizontal planes and which are closed by means of the multiple valves D, D', and D². As soon as the pulp is sized all of these outlet-valves may be opened and as a consequence the pulp be classified according to its gravity, weight, or mixture of the particular layer and led as desired to different concentrators by means of suitable launders.

When pulp is supplied in large quantities, so that one concentrator cannot take care of one entire classified product, it is desirable to distribute the same to several concentrators, and in order to accomplish this result I make the discharge-valves with multiple openings, preferring four openings d, as shown

in the drawings, which are opened and closed simultaneously by means of the plugs d' , each of which is provided with indicating-handles d^2 and springs d^3 , which act to keep the plugs firmly on their seats. It will thus be seen that when the valve is open a uniform distribution through several pipes takes place, and each concentrator is fed with a uniform quantity of classified pulp.

From the foregoing it will be seen that two or more classified products may be discharged at the same time, and such classified products may be divided and distributed to several different concentrators in uniform quantities.

At times the supply of pulp to the classifier may be more than the several discharge valves and pipes can take care of, so that there is an overflow of very fine pulp or slime. In order to take care of this, I make the receptacle of such size and shape that the partition A^3 , which forms one of the sizing-chambers, is lower than the walls of the receptacle, so as to provide a third chamber A^4 , into which the overflow may pass and from which it may be withdrawn through the discharge-pipe E and led to any desired concentrator.

In operation the water and sand, being the entire issue of a stamp-battery or other wet crushing-mill for reducing ore, is led by a suitable launder to the top of the main or pressure chamber and passing down the same and through the passage a enters the sizing-chamber A^2 , from which it may be drawn out through the lowest row of openings by means of the valve D. If the areas of the lowest row of openings are sufficient to take care of the quantity coming in, there will be no rise of water in the pressure-column or main chamber; but when the discharge-valves are closed or partly closed the water will rise in both the pressure and sizing chambers proportionately. By gradually closing the valves which govern the lower set of discharge-openings the water may be made to rise and a portion of it caused to overflow and pass out through a discharge-pipe E, carrying with it a small portion of the lighter slimes which are held in suspension. As many rows of openings with controlling-valves may be provided as there are numbers of different classes or degrees of products desired and the valve so adjusted as to give the quantity and quality for the product desired. Ordinarily the valve should be kept closed sufficiently to keep the pulp backed up to fill the pressure and settling chambers nearly to the point of overflowing and holding it there, thus providing the necessary pressure to obtain the best results. Where the quantity of water entering with the sands is in excess of the amount desired upon the concentrating-machines, it may be separated by closing discharge-openings to force the amount which is in excess to overflow and pass out through the discharge-opening E without in any way interfering with the uniformity of the product coming out through the distributing-pipes. In passing

through the connecting-passage a under the pressure of a column of water twelve inches or more the sands are equally distributed throughout the width of the stream which is carrying them, both as to gravity and volume, and are therefore equally distributed throughout the less-agitated volume of water in the sizing-chamber and are free to fall to the bottom thereof. As the speed of the current is lessened the closer or heavier particles will pass down the faster through the first discharge-valves, the next sized through the second set, and so on.

The principal advantages due to the use of a classifier and distributor constructed in accordance with my improvements are, first, that it separates the sands economically and efficiently into the different classes; second, that it separates the excess of water, and, third, that it divides each class of pulp into several parts uniformly as to volume of water and contained sands and concentrates.

I claim—

1. In an apparatus of the class described, a receptacle provided with a pressure-chamber and a sizing-chamber connected together by means of a narrow channel at the lower portion thereof, and discharge-valve mechanism in the sizing-chamber to draw off the classified product, substantially as described.

2. In an apparatus of the class described, a receptacle provided with a pressure-chamber and a sizing-chamber connected together by means of a narrow passage at the lower portion thereof, an overflow-chamber arranged to take the overflow from the sizing-chamber and provided with a discharge-opening at or near the lower portion thereof, and discharge-valve mechanism in the sizing-chamber arranged to draw off the classified product, substantially as described.

3. In an apparatus of the class described, a receptacle provided with a pressure-chamber having a supply-opening and a sizing-chamber connected together by means of a narrow passage at the lower part thereof, a screen in the pressure-chamber arranged underneath the supply-opening, a baffle-board in the sizing-chamber to break up the current therein, and valve mechanism in the sizing-chamber to draw off the classified product, substantially as described.

4. In an apparatus of the class described, a receptacle provided with a pressure-chamber having a supply-opening and a sizing-chamber connected with it at the lower portion thereof, an overflow-chamber arranged to take care of the overflow from the sizing-chamber and provided with a discharge-pipe at or near the lower part thereof, a screen in the pressure-chamber arranged underneath the supply-opening, a baffle-board in the sizing-chamber arranged adjacent to the connecting-channel to break up the current or aid therein, and discharge-valve mechanism connected with the sizing-chamber to draw off the classified product, substantially as described.

5. In an apparatus of the class described, a receptacle provided with a pressure-chamber having a supply-opening, a sizing-chamber connected therewith at or near the lower portion of the same, and an overflow-chamber arranged to take care of the overflow from the sizing-chamber and provided with a discharge-passage at or near its lower portion, a screen in the pressure-chamber arranged adjacent to and underneath the supply-opening, an inclined baffle-board in the sizing-chamber arranged adjacent to the connecting-passage to break up the eddy or current of pulp, and several multiple discharge-valves connected with the sizing-chamber and arranged in different horizontal planes to take care of the classified product and distribute the same uniformly through their several discharge-openings, substantially as described. 15

FREDERIC W. SHERMAN.

Witnesses:

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