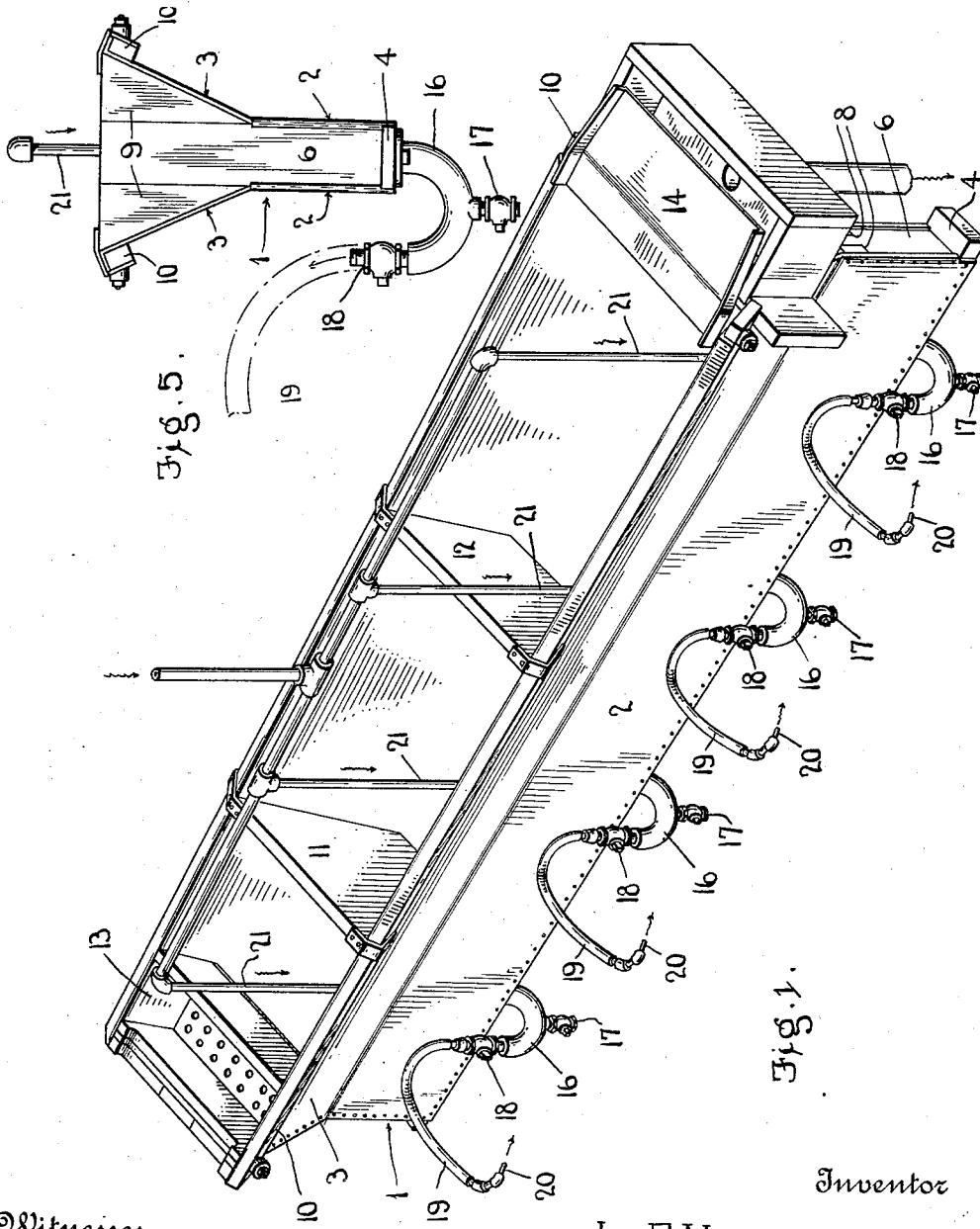


I. F. MONELL.
SLIME DEWATERING GRAVITY DEVICE.
APPLICATION FILED JUNE 6, 1912.

1,074,192.

Patented Sept. 30, 1913.

2 SHEETS—SHEET 1.



Witnesses
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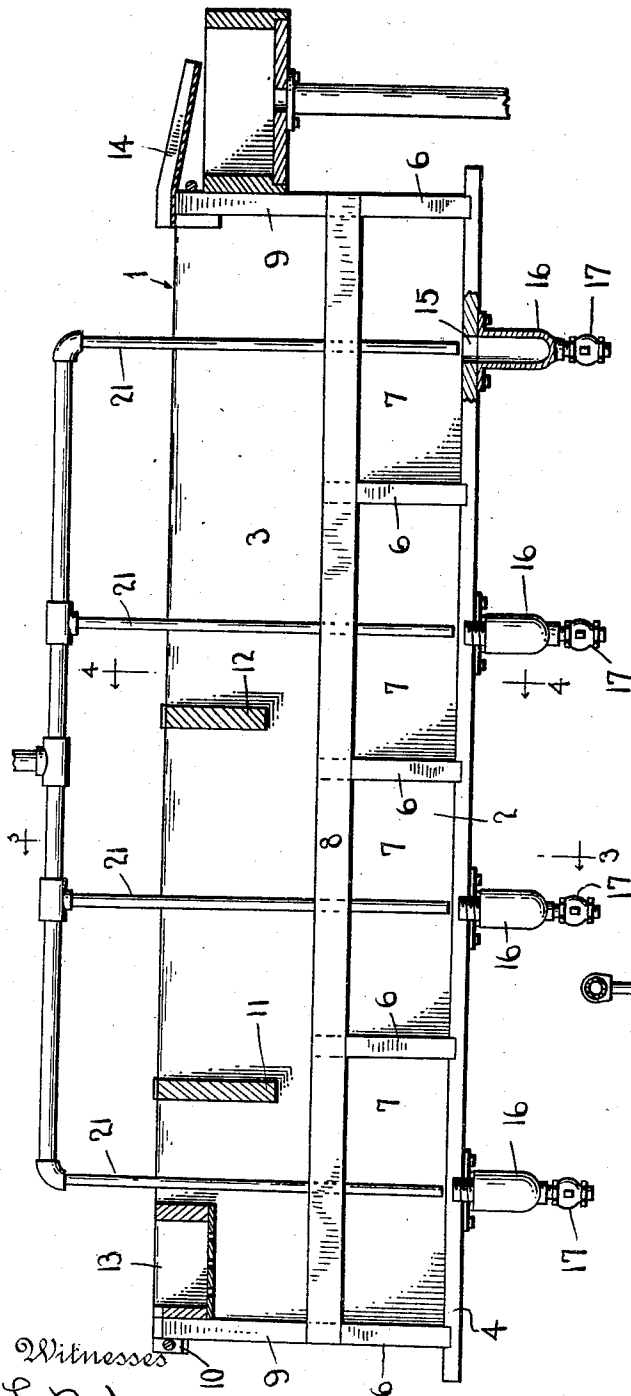
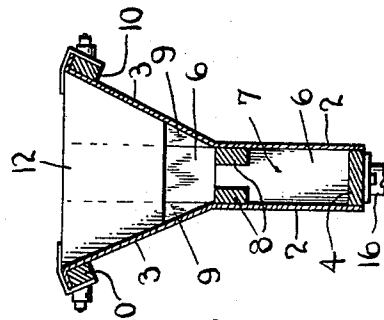


Fig. 4.

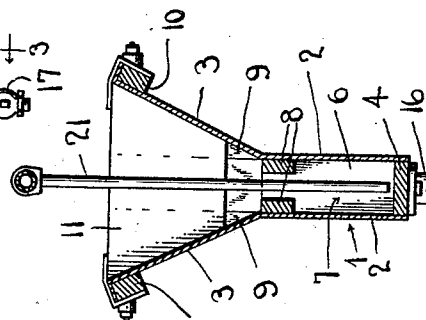


Fig. 3.

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Fig. 2.

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UNITED STATES PATENT OFFICE.

IRA F. MONELL, OF BOULDER, COLORADO.

SLIME-DEWATERING GRAVITY DEVICE.

1,074,192.

Specification of Letters Patent.

Patented Sept. 30, 1913.

Application filed June 6, 1912. Serial No. 702,103.

To all whom it may concern:

Be it known that I, IRA F. MONELL, a citizen of the United States, residing at Boulder, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Slime-Dewatering Gravity Devices; and I do 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 ore separators, and more particularly to that class of separators known as pulp thickening and gravity sizing apparatus.

One object of the invention is to provide a simply constructed and efficient apparatus for thickening and sizing by gravity the slimes of ore which are received from a deslimer apparatus.

Another object is to provide an apparatus of this character in which the coarser particles of greater specific gravity are classified in compartments while the volume of the pulp solution is reduced without loss of slimes or fine values, thus reducing the mill toll to the smallest possible amount containing all the fine values.

The slimes which are obtained from a deslimer contain from three to ten per cent. solids in which there are about one hundred, more or less, different gravity sizes. The separating machines now in use will separate about fifty or sixty of these if the water flow is not too heavy. Slimers containing three per cent. or even ten per cent. solids require a machine having a large surface because of the excess of water which is contained in the slimes, and it is the object of this invention to produce an apparatus for classifying and thickening the slimes, and which will occupy very little space, about fifty per cent. of that required by the machine now in use, and which requires about one-fourth only of the table surface usually employed.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 represents a perspective view of an ore pulp

thickening apparatus constructed in accordance with this invention; Fig. 2 represents a side elevation thereof with one of the side members removed and with parts broken out; Fig. 3 represents a transverse vertical section taken on the line 3—3 of Fig. 2. Fig. 4 is a similar view on line 4—4 of Fig. 2; Fig. 5 is an end elevation thereof.

In the embodiment illustrated, a tank or receptacle 1 is shown the lower half of which has straight, vertical side walls 2, which merge at their upper ends into flaring or diverging walls 3, which form the upper portion of the tank. The straight wall portion of the receptacle is preferably about eighteen inches deep and five inches wide and extends the length of the tank, which is about ten feet, more or less. This apparatus is preferably constructed of two by five timbers, one of which forms the bottom 4 of the tank, being disposed horizontally the width of the tank bottom. A plurality of two by five timbers (shown at 6) are arranged vertically and secured at one end to the bottom 4 at suitable distances apart, to form the cells of the apparatus. These members 6 are about eighteen inches long, and are preferably spaced equal distances apart forming partitions in the tank whereby the settling cells 7 are formed, for a purpose to be described. Boards 8 connect the upper ends of the members 6 at opposite side edges thereof, being preferably set to said members 7 to dispose them in vertical alinement with the side edges of the bottom 4. Substantially triangular members 9 are secured to the upper ends of the end members 6 and side bars 10 connect the upper ends of said members 9 to form the hopper-like upper portion of the tank. Any desired number of uprights 6 may be employed, five being here shown, to form four thickening cells 7.

The side walls of the apparatus are preferably formed of sheet metal, which is secured to the outer faces of the bottom 4, uprights 6 and side bars 8, and the upper edges thereof are extended over the inner faces of the side bars 10 and secured to said bars by any suitable means. These walls are also secured to the end member 9 by nails or other suitable elements.

Baffle boards 11 and 12 extend transversely across the upper portion of the tank 1 at suitable intervals. The board 11, which is arranged nearer the feed box 13, is about
 5 twelve or fourteen inches wide, and the lower edge thereof terminates about four inches above the top of the cells 7. The board
 12 is about six inches wide, and its lower edge terminates about one foot from the top
 10 of the cells. These boards are designed to force the current of water which flows from the feed box to pass thereunder, which prevents the heavier particles contained therein rising to the surface and passing out over
 15 the overflow 14 at the end of the tank opposite to the feed box 13.

The bottom 4 of the tank is provided with a plurality of apertures 15, one of which is formed in each cell 7, and is designed to
 20 form an outlet for said cell, a goose-neck trap 16 being connected with each one of these openings for conducting the thickened pulp from the cell bottoms. These goose-necks are provided with plug valve connections 17 for draining the tank when desired.
 25 They are each also provided with a plug valve 18 for checking the pressure of the tank, and the opening therein is preferably round to prevent clogging.

30 Lengths of rubber hose 19 are preferably connected to the one-half inch pipes of the goose-necks for raising or lowering the discharge of the thickened pulp as may be desired, and they are provided at their free
 35 ends with two and one-half inch nipples 20 which are preferably reduced at their outlet ends to one-fourth inch nipples for reducing the discharge of the thickened pulp as well as offer a sufficient amount of resistance to
 40 the substances passing therethrough so as to prevent it from creating suction at the inlet ends of the goose-necks.

A plurality of hydraulic pipes 21 extend downwardly through each cell 7 a sufficient
 45 distance above the center of each goose-neck to permit the water as it is discharged from said pipe 21 toward the centers of said goose-necks to create a gushing action around the entrance of the goose-neck there-
 50 by causing all substances coming within the range of the gushing water to be deflected toward the entrance of the goose-neck and thus be more vigorously actuated before the heavier particles therein force their passage
 55 through the gushing water.

The thickening cell 7 being narrow, the pulp which settles in the wider upper portion of the tank will drop into the cells by gravity, thus forming a gravity size at each
 60 cell as the current passes from the feed box 13 at one end of the tank to the overflow 14 at the other end thereof.

The openings 15 in the cell bottom permit the thickened pulp to pass from the cells to

the goose-necks and because of the height 65 and narrow width of the cell the pulp will readily drop into the openings. If desired, these cells can be made higher than the height specified to provide a somewhat acute angle from the top of the cell to the opening. 70

The feed box 13 may be of any suitable or desired construction, but is preferably provided with a metallic bottom having a multiplicity of openings therein to permit the pulp to flow easily to avoid boiling and
 75 thereby cause a smooth current to flow from one end of the tank to the other to permit the solids contained in the slimes to settle as they pass from the feed box to the overflow. The overflow 14 may be discharged into a
 80 wider tank or into any suitable receptacle.

In the operation of this apparatus, the pulp is fed into the tank at the upper portion of one end through the perforated bottom of the feed box 13, whereby boiling is
 85 prevented. The current of pulp so fed in flows smoothly through the tank to the overflow 14, the heavier particles or solids settling or falling by gravity to the bottom of the tank during the passage of the pulp
 90 through the tank. The pulp settling in the wide upper part of the tank will drop by gravity into the cells, whereby a gravity size is formed at each cell as the current passes from the feed box to the overflow. The
 95 passing current is thus split, checked and divided, becoming more sluggish in its movement, the baffles causing the heavier particles contained in the pulp to fall by gravity to their respective cells at the bottom of the
 100 tank and the lighter particles to pass to the next baffle, gradually settling into the cells as they pass along. The thickened pulp in each cell passes out through the opening 15 to the goose-neck 16 below, and the pipes 21
 105 which discharge into the goose-necks of the various cells are designed to supply water under pressure for washing out the necks in case they should become clogged. The pulp from the goose-necks passes through the hose
 110 19 and reduced nipples 20, whereby the thickened slime pulp may be drawn off with very little water, which could not be done if drawn from the bottom of the goose-neck unless a very small opening were provided,
 115 which would be likely to clog.

I claim as my invention:

A pulp classifying and slime thickening apparatus comprising a tank having a long narrow settling chamber divided into a plu-
 120 rality of compartments each of which has an opening in its bottom, the upper end of said narrow chamber merging into a flaring current chamber, the opening between said current chamber and settling chamber being re-
 125 duced, a plurality of baffle boards depending into said current chamber and arranged over the compartments of the settling chamber,

the board nearest the inlet end of the current
chamber being longer than the others, hy-
draulic pipes having their discharge ends
arranged directly above the entrance to the
5 openings in the compartments of the settling
chamber and means for restricting the ca-
pacity of said openings.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

IRA F. MONELL.

Witnesses:

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WILLIAM T. MCGINNIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
