

C. W. MERRILL.

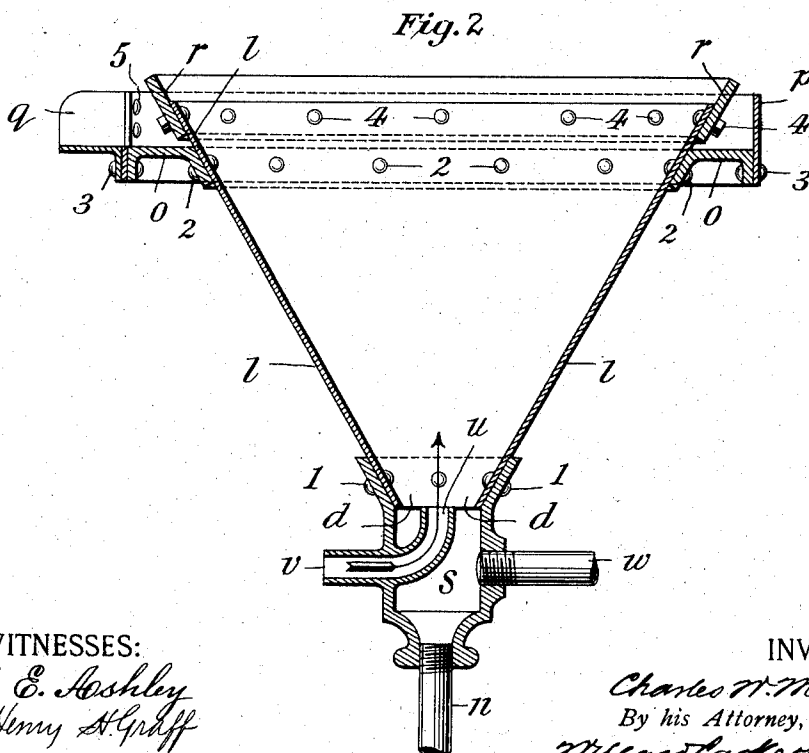
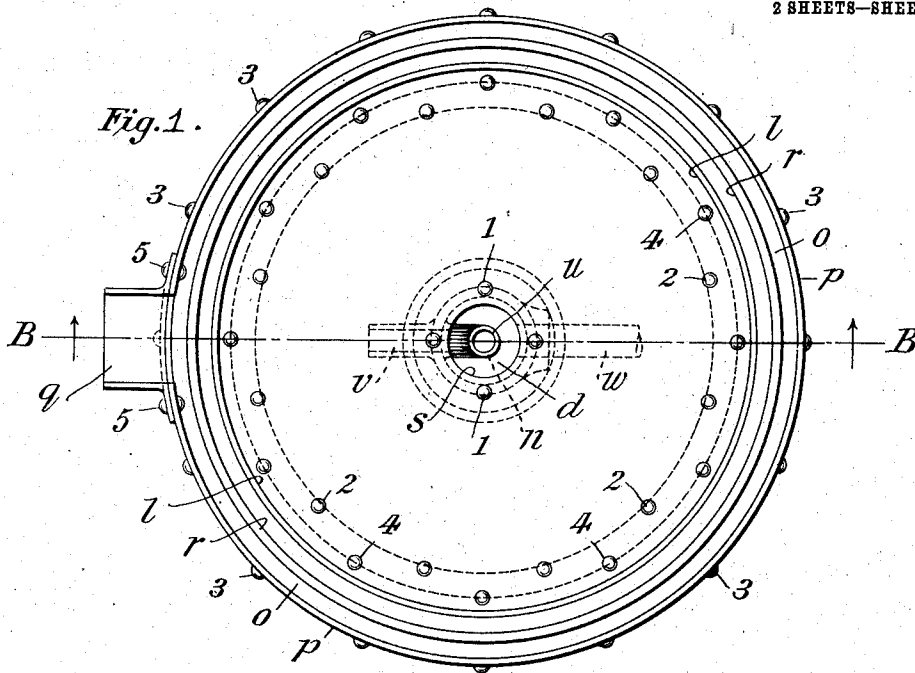
CLASSIFIER.

APPLICATION FILED JULY 10, 1905.

907,387.

Patented Dec. 22, 1908.

2 SHEETS—SHEET 1.



WITNESSES:

C. E. Ashley
Nemy A. Graff

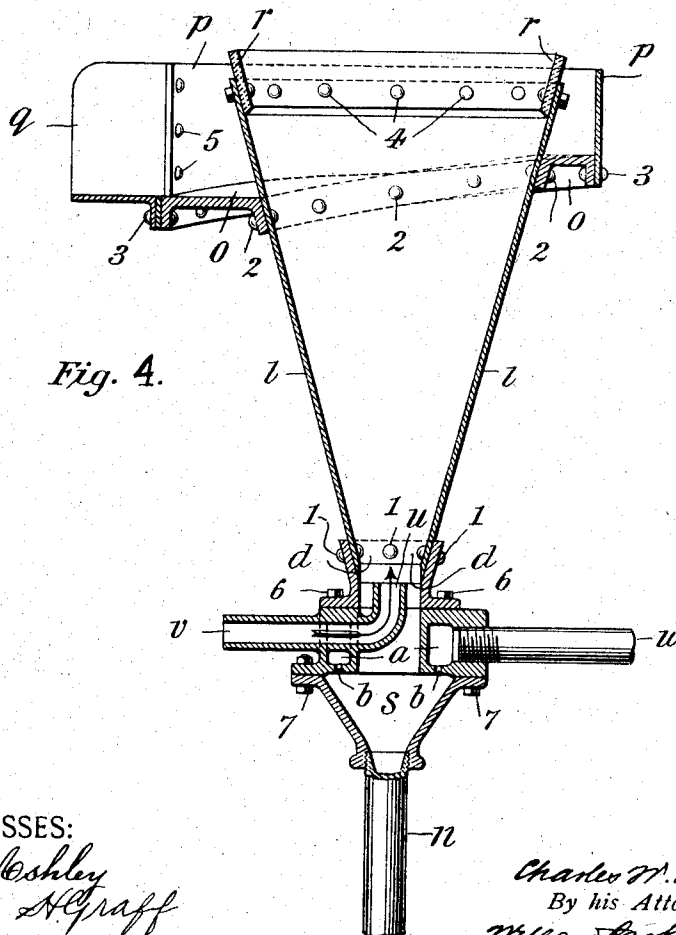
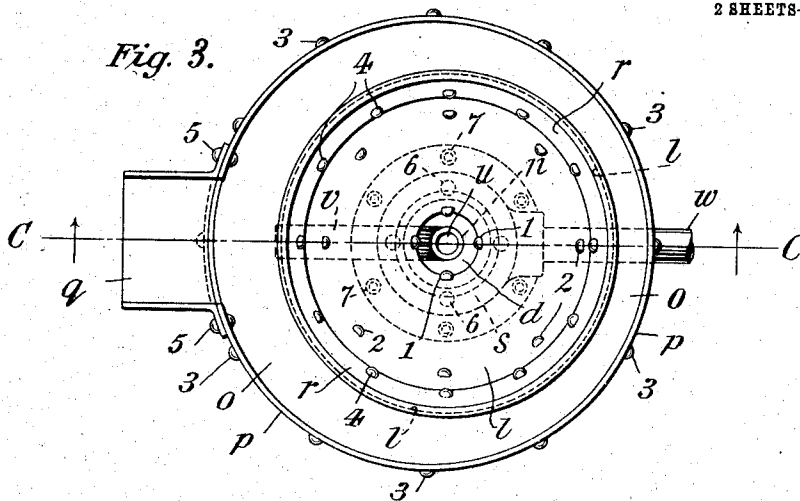
INVENTOR

Charles W. Merrill
By his Attorney,
William Parker Smith

CLASSIFIER.

907,387.

2 SHEETS—SHEET 2.



WITNESSES:

C. E. Ashley
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INVENTOR

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UNITED STATES PATENT OFFICE.

CHARLES W. MERRILL, OF LEAD, SOUTH DAKOTA.

CLASSIFIER.

No. 907,387.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed July 10, 1905. Serial No. 268,946.

To all whom it may concern:

Be it known that I, CHARLES W. MERRILL, citizen of the United States, and resident of Lead, county of Lawrence, State of South Dakota, have invented a new and useful Improvement in Classifiers, of which the following is a specification.

My invention relates to improvements in apparatus for separating the heavier or coarser from the lighter or finer components of crushed ores or other valuable material, these separations being technically known as concentrating, classifying &c.

The improvement consists especially in improvement upon the forms of classifier described by me and claimed in Letters Patent of the United States No. 728,487, granted to me on the 19th day of May 1903.

In practice there are many classifiers the receiver of which is made in the form of an inverted cone or pyramid, which is provided with a downward feed through which the material to be classified enters at the top of the receiver, the coarser or heavier portions settling at the bottom. The downward direction and location of the feed inlet, is primarily adapted to classifiers in which it is merely desired to make a rough separation of the fine slimes and the coarse sands, and the disadvantage of this construction is that the overflow particles have to make a complete turn in their direction before they can be overflowed, which is particularly undesirable where a very close separation between fairly heavy and coarse material and the very heaviest or coarsest material and concentrates is to be effected.

I have discovered that if the feed be changed and an upward feed be substituted for the downward feed shown in the patent, and if the classifier be provided with an outlet space adjacent to and preferably surrounding the upward feed but without the zone of the said feed, it is possible to separate the concentrates or heaviest particles and overflow not merely the slimes but also comparatively coarse sands, for the reason that in this case there is no change of direction involved in the upward flow as there is in the downward flow. Moreover, the discharge of the heavier and coarser particles is facilitated for the reason that after being separated out they are not brought in contact with the upward movement of the feed as the existence of conflicting currents notably

present where a downward feed from the top is employed, is avoided.

In carrying out the present invention, I make use of an inverted truncated cone or pyramid, with sides comparatively steep, with an upward feed placed at or near the plane of truncation and surrounded by an annular space between the feed inlet and the converging sides of the cone or pyramid. The aforesaid shape produces a reduction in the velocity of the ascending pulp, thus permitting and allowing the gradual descent of the heaviest particles of the mass, and the annular space forms an outlet for the downward passage of the heavier and coarser particles located without the feed zone. The pulp containing the finer and lighter particles is overflowed preferably along the line of the whole periphery, said periphery being preferably constructed of a comparatively soft substance capable of being easily maintained exactly level.

The invention will be best understood by reference to the accompanying two sheets of drawings forming a part of this specification, in which—

Figure 1 shows the plan view and Fig. 2 a vertical section of a classifier embodying my invention. Figs. 3 and 4 show respectively, a plan view and a vertical section of a modified form.

Similar letters refer to similar parts throughout the several views.

In the form of classifier shown in Figs. 1 and 2, *l* represents a cone shaped shell, with a truncated apex. The apex is surrounded by a supplemental discharge chamber *s* into which enters a wash water pipe *w* and from which emerges a discharge pipe *n*; *u* represents the vertical inlet; *r* represents the overflow rim, which in this case is the entire upper periphery of the cone and is attached by the bolts 3. The overflow launder is composed of the annular ring *o*, attached by the rivets 2 surrounded by the vertical side *p*, attached by the rivets 3; *q* is the spout from which the overflow passes away.

Figs. 3 and 4 show the present invention applied to the form of classifier described and claimed in the aforesaid patent. This consists of a closed downwardly converging receiver with a discharge opening at the bottom, provided with a closed clear water chamber, said chamber having a continuous channel opening downwardly into the re-

ceiver. In Figs. 3 and 4 the upper parts are the same as of the previous construction, but in the modified form of the classifier shown in the aforesaid patent and necessitated by the application thereto of the present invention, *a* is an annular inlet which is placed between the truncated apex and the supplemental chamber *s* and which is formed of a casting as shown in Fig. 4. The wash water pipe *w* enters at one side as before, and the wash water passes around through the annular channel *a* within the casting and emerges through the slot *b b* into the supplemental chamber *s*. *u* is the inlet pipe, which enters through the casting and passes up into the shell *l* as shown, with an annular space between it and the walls, as in the construction shown in Figs. 1 and 2.

I claim as my invention:

1. A classifier having a downwardly converging receiver provided with a pulp inlet delivering upward; a pulp overflow above said pulp inlet; a pulp outlet below said pulp overflow and situated without the feed zone; a supplemental chamber into which said outlet leads, an inlet for washing medium leading into said chamber, and a pulp discharge therefrom.

2. A classifier having a downwardly converging receiver provided with a pulp inlet delivering upward; a pulp overflow periphery above said pulp inlet; a pulp outlet below said pulp overflow and situated without the feed zone; a supplemental chamber into which said outlet leads, an inlet for washing medium leading into said chamber, and a pulp discharge therefrom

3. A classifier having a downwardly converging receiver provided with an upwardly delivering pulp inlet, a space between said inlet and the sides of the body of said classifier, a pulp outlet from said space, a supplemental chamber into which said outlet leads, an inlet for washing medium leading into said chamber, a pulp discharge therefrom, and a pulp overflow periphery above said pulp inlet.

4. A classifier having a downwardly converging receiver provided with an upwardly delivering pulp inlet, a space between said inlet and the sides of the body of said classifier, a supplemental chamber leading from said space and provided with a pulp outlet and an inlet for washing medium leading into said chamber, a pulp discharge therefrom, and a pulp overflow above said pulp inlet.

5. A classifier having a downwardly converging receiver provided with a top pulp overflow rim, a central upwardly delivering pulp inlet adjacent to the apex of said classifier, an annular space between said pulp inlet and the sides of the body of said classifier, a supplemental conical chamber leading from said space, an annular ring for the introduction of washing medium to said chamber and a pulp discharge from said chamber.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two witnesses, this seventh day of July, 1905.

CHARLES W. MERRILL.

Witnesses:

WILLARD PARKER BUTLER,
JOHN FRENCH.