No. 820,934. PATENTED MAY 15, 1906.

C. W. MERRILL.

CLASSIFIER.

APPLICATION FILED AUG. 4, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

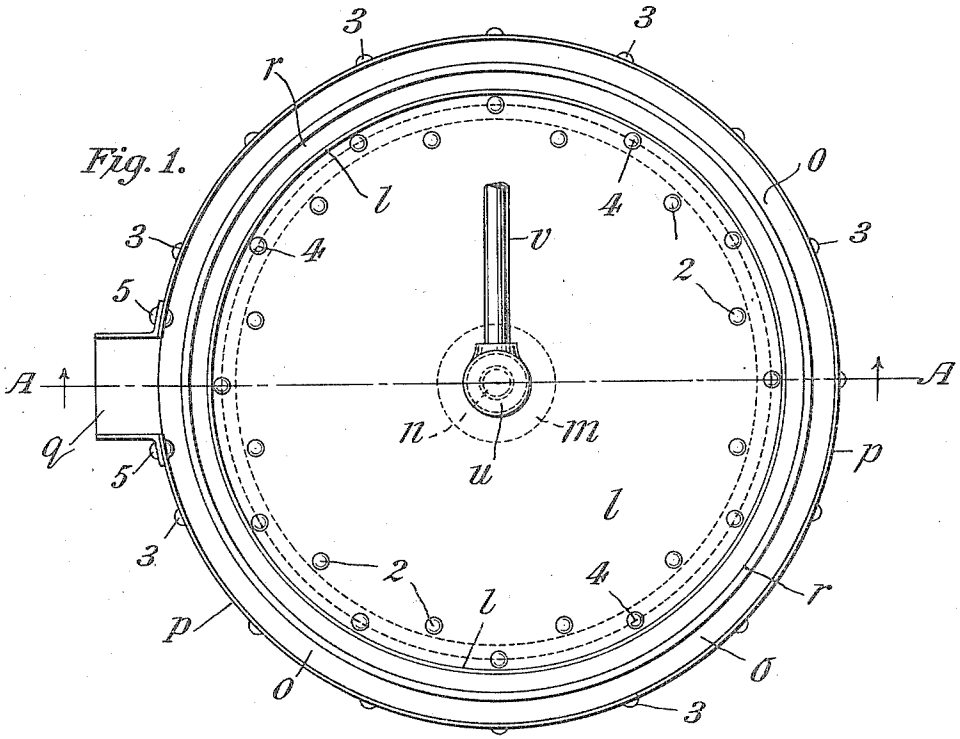
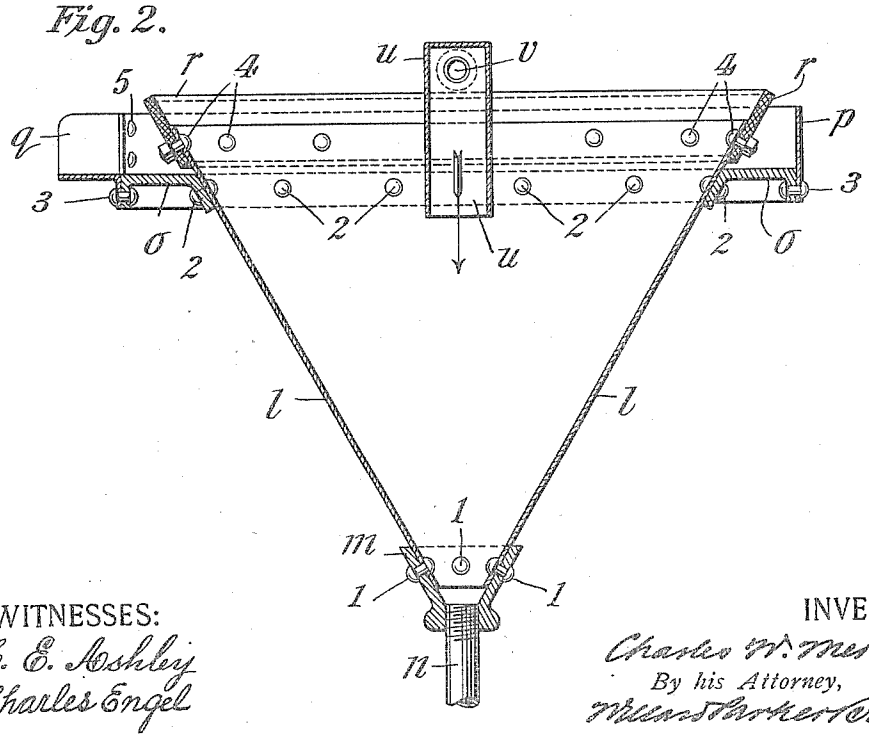


Fig. 2.



WITNESSES:

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Charles Engel

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2 SHEETS—SHEET 2.

Fig. 3.

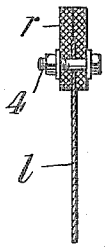


Fig. 4.

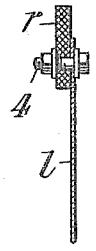


Fig. 5.

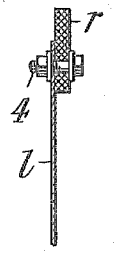
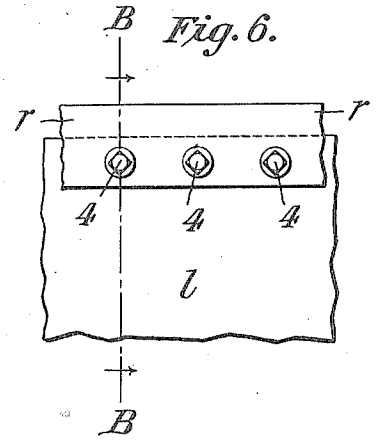


Fig. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES W. MERRILL, OF LEAD, SOUTH DAKOTA.

CLASSIFIER.

No. 820,934. Specification of Letters Patent. Patented May 15, 1906.

Original application filed November 25, 1904, Serial No. 234,306. Divided and this application filed August 4, 1905. Serial No. 272,720.

To all whom it may concern:

Be it known that I, CHARLES W. MERRILL, a citizen of the United States, and a resident of Lead, county of Lawrence, State of South Dakota, have invented certain new and useful Improvements 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 found in tailings of ores or in other valuable material, these separations being technically known as "concentrating," "classifying," "clarifying," &c.

These improvements consist in providing classifiers with lines of overflow made of soft material which may be easily kept level.

In the crushing of ores with water, to which wet-crushing my invention relates, after the pulp, which is a mixture of the crushed ore with water, has been subjected to such treatment as may be desired, such as amalgamation or concentration, &c., it is customary to separate it into coarse and fine particles. This is effected by classifiers having in general a discharge at the bottom for the coarser material, together with a portion of the water, and an overflow-line over which the finer particles and a portion of water overflow. Such classifiers are simple gravity-classifiers or hydraulic classifiers, which differ from the simple gravity-classifiers in that they have a wash-water inlet at the bottom.

In the apparatus which have been employed for separating or classifying said material conical, pyramidal, cylindrical, or other shaped hoppers, tanks, or receivers made of iron, porcelain, wood, &c., have been employed, the overflow-peripheries of which are difficult to make and keep level. For instance, cast and sheet iron cones have been used with iron lines of overflow; similarly, porcelain vessels with porcelain lines of overflow. Also wooded tanks have been used with the line of overflow consisting of end wood, such as the ends of staves, said line of overflow thus being across or transverse to the grain of the wood. With all of these materials it is difficult to make the line of overflow as perfectly level as is necessary to minimize uneven currents or velocities over the line of overflow. Such uneven currents interfere with the most efficient classification or separation.

In addition to the above difficulty in first effecting an even line of overflow with such apparatus, any uneven settling of the apparatus introduces a further difficulty in maintaining the line of overflow sufficiently level to minimize uneven velocities thereover. Now I have discovered that by making the overflow line of the receiver of the classifier either of a thin strip of soft metal or an alloy softer than iron—such for example as lead or pewter—the difficulties above referred to will be obviated.

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 is a plan view of a classifier embodying my invention. Fig. 2 is a vertical section of the classifier on the line C C, Fig. 1. Figs. 3, 4, and 5 show vertical sections of the upper portion of the classifier, and Fig. 6 is an elevation showing the method of attaching the rim of the classifier to the body.

Similar characters refer to similar parts throughout the several views.

In Figs. 1 and 2, *u* represents the inflow-pipe, *n* represents the outflow-pipe, *r* represents the edge of the overflow-line, and *q* represents the spout through which the overflow passes out.

The classifier consists of a cone-shaped shell *l*, resting in a conical box *m*, to which it is attached by the bolts 1 1, and from it emerges the outlet-pipe *n*. The overflow is collected in an annular trough composed of a ring *o*, bolted by the bolts 2 to the upper edge of the shell 1, as shown in Fig. 2, to which is bolted a cylindrical shell *p* by means of the bolts 3. The soft-metal overflow-line (shown in Figs. 3 to 6, inclusive) may be attached to the shell by the bolts 4, as shown.

The overflow-line can readily be kept level by planing or beveling down the edge of the part *r* from time to time, as may be necessary in all ordinary cases, without removing the bolts 2 2.

Having previously, on the 25th day of November, 1904, filed another application in the United States Patent Office, under Serial No. 234,306, for patent for classifiers, of which the present case is a division, I disclaim for the purposes of this application a static classifier with a sheet-iron body provided with an overflow-line of a soft sub-

stance, substantially of the character specified in said application, having a feed wholly within the periphery.

I claim as my invention—

1. A classifier provided with an overflow-line of soft metal, substantially as described.

2. A classifier provided with an overflow-line of soft metal extending around its entire periphery, substantially as described.

3. A static classifier consisting of a receiver having a feed wholly within the periphery, and said periphery being provided with an overflow-line of soft metal, substantially as described.

4. A static classifier consisting of a receiver having a sheet-iron body, a feed wholly within the periphery, a bottom discharge and an overflow-rim composed of a strip of soft metal.

In testimony that I claim the foregoing as my invention I have signed my name, in the presence of two witnesses, this 29th day of July, 1905.

CHARLES W. MERRILL.

Witnesses:
WM. FRACKELTON,
G. D. FOGLESONG.