No. 849,153. PATENTED APR. 2, 1907.

C. W. MERRILL.

CLASSIFIER.

APPLICATION FILED NOV. 25, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

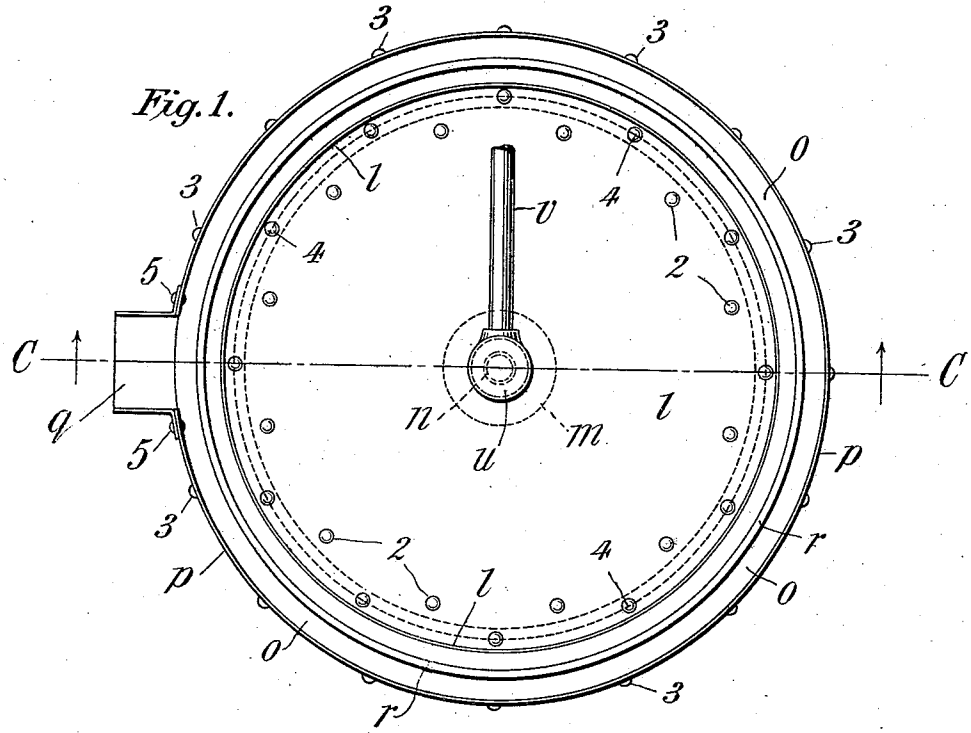
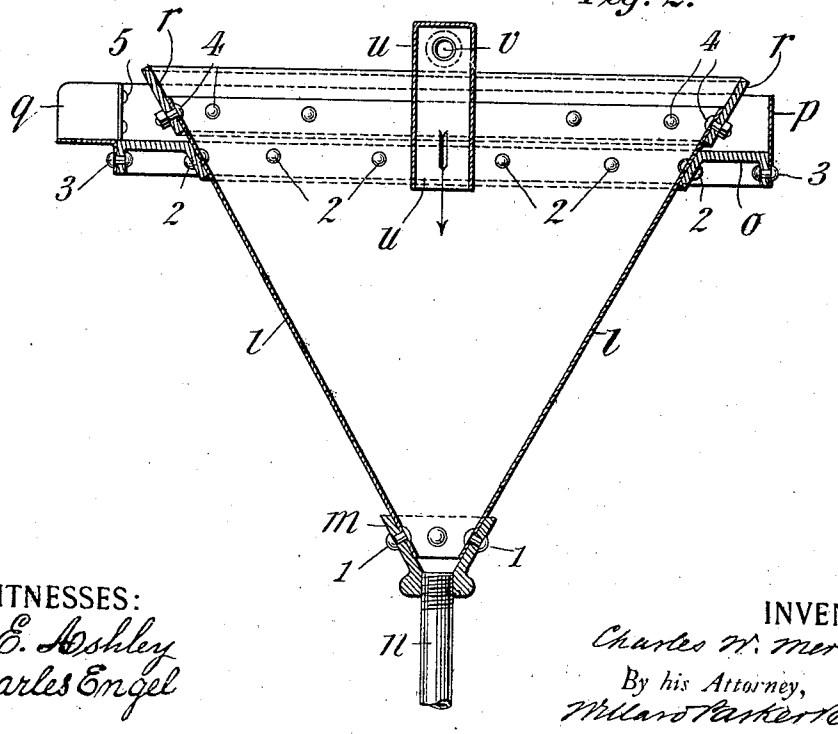


Fig. 2.



WITNESSES:

C. E. Ashley

Charles Engel

INVENTOR

Charles W. Merrill

By his Attorney,

Millard Parker Butler

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2 SHEETS—SHEET 2.

Fig. 3. Fig. 4. Fig. 5. Fig. 6.

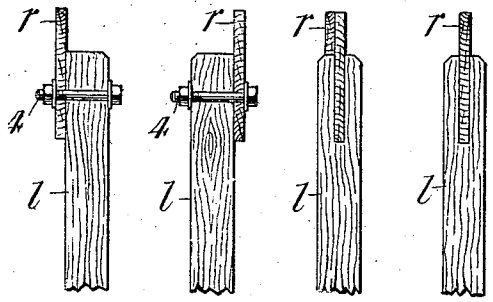


Fig. 7.

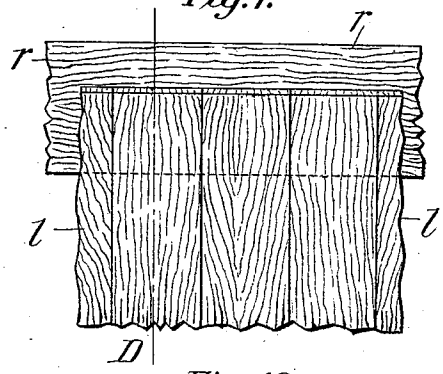


Fig. 8. Fig. 9. Fig. 10. Fig. 11.

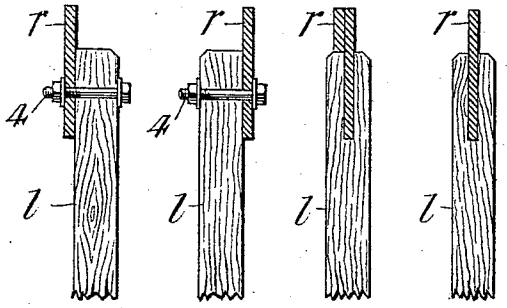


Fig. 12.

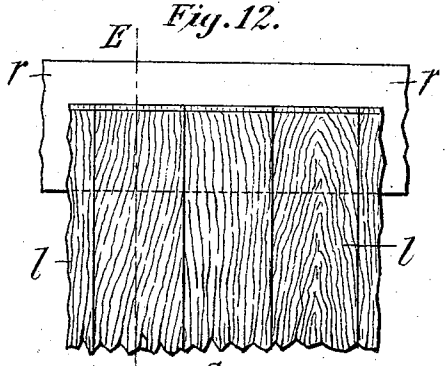


Fig. 13. Fig. 14. Fig. 15. Fig. 16. Fig. 17.

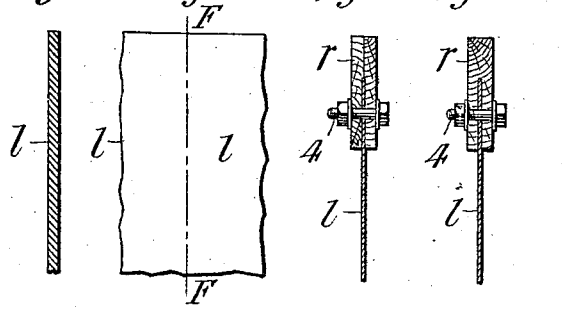


Fig. 18.

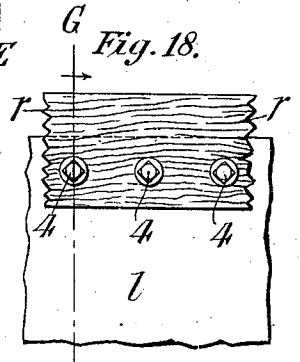


Fig. 19. Fig. 20. Fig. 21.

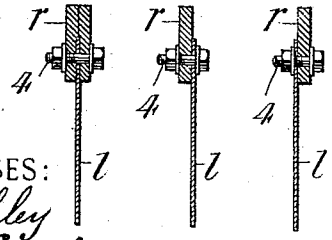
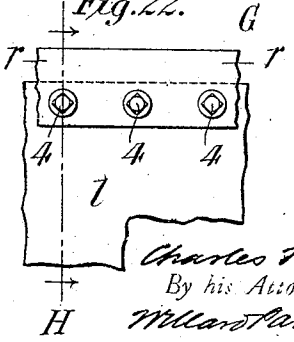


Fig. 22.



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CLASSIFIER.

No. 849,153. Specification of Letters Patent. Patented April 2, 1907.

Application filed November 25, 1904. Serial No. 234,306.

To all whom it may concern:

Be it known that I, CHARLES W. MERRILL, a citizen of the United States, residing at Lead, county of Lawrence, State of South Dakota, have invented Improvements in Classifiers; and I hereby declare the following to be a full, clear, and exact description of the same.

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 the 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, wooden 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 wood with the grain approximately horizontal, or of a metal or 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 classifier embodying my invention. Fig. 2 is a vertical section of the classifier shown in Fig. 1. Figs. 3 to 6, inclusive, show vertical sections of the upper edge of a classifier the main body of which is made of wood with the grain approximately vertical. Fig. 7 shows a side view of this construction. Figs. 8 to 11, inclusive, show vertical sections of an upper portion of a classifier provided with an overflow-line of soft metal attached in substantially the same manner as shown in Figs. 3 to 6. Fig. 12 is a side view of this construction. Figs. 13 and 14 are a section and projection, respectively, of an upper portion made of soft metal. Figs. 15 to 18, inclusive, represent the upper portion of a classifier the main body of which is made of hard metal and which is provided with the line of overflow made of wood with the grain approximately horizontal; and Figs. 19 to 22, inclusive, the upper portion of a classifier the main body of which is made of hard metal and which is provided with an overflow-line of soft metal.

Similar letters 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 *l*, as shown in Fig. 2, to which is bolted a cylindrical shell *p* by means of the bolts 3. The devices shown in Figs. 3 to 22, inclusive, may be attached to the shell by

the bolts 4, as shown in Figs. 1 and 2, or in the manner shown in Figs. 3 to 22, inclusive.

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 heretofore on the 4th day of August, 1905, filed a divisional application, Serial Number 272,720, relating to a classifier provided with an overflow-line of soft metal, I hereby disclaim for the purposes of this case the subject-matter of the said application.

I claim as my invention—

1. A classifier provided with an overflow-line of soft substance substantially of the character specified extending around its entire periphery substantially as described.

2. 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 substance substantially of the character specified substantially as described.

3. A static classifier consisting of a receiver having a main body of metal and a feed wholly within the periphery and said periphery provided with an overflow-line composed of a thin strip of wood with the grain approximately horizontal.

4. A static classifier, consisting of a sheet-iron body, a feed wholly within the periphery, and an overflow-rim composed of a thin strip of wood with the grain approximately horizontal.

5. A static classifier, consisting of a receiver having a sheet-iron body, a bottom discharge, and an overflow-line composed of a thin strip of wood with the grain approximately horizontal.

CHARLES W. MERRILL.

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