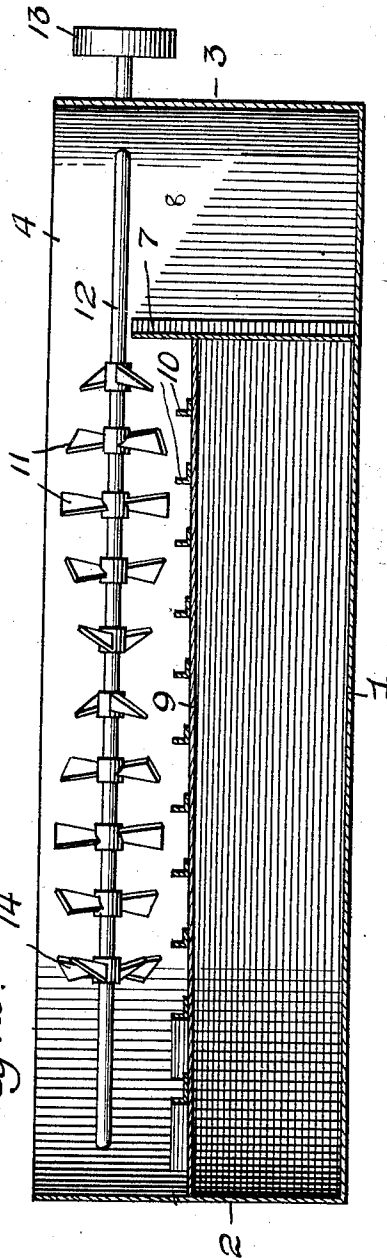
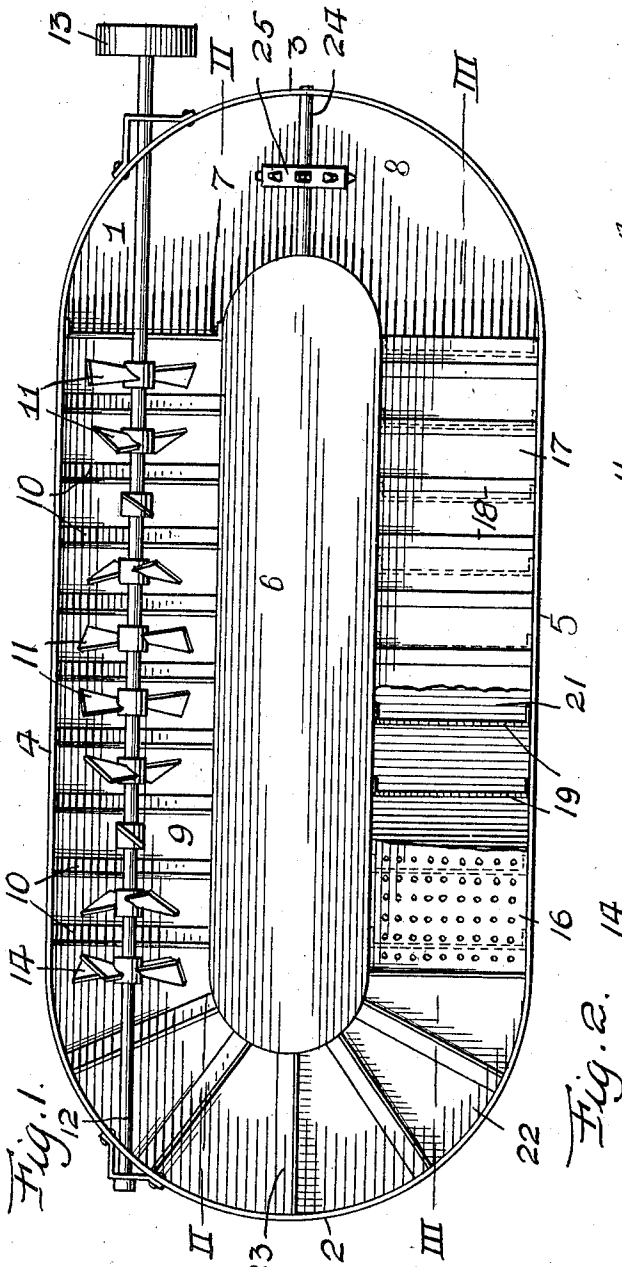


S. L. BOGGS.
SEPARATOR AND COLLECTOR FOR METALS.
APPLICATION FILED APR. 6, 1912.

1,037,114.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.



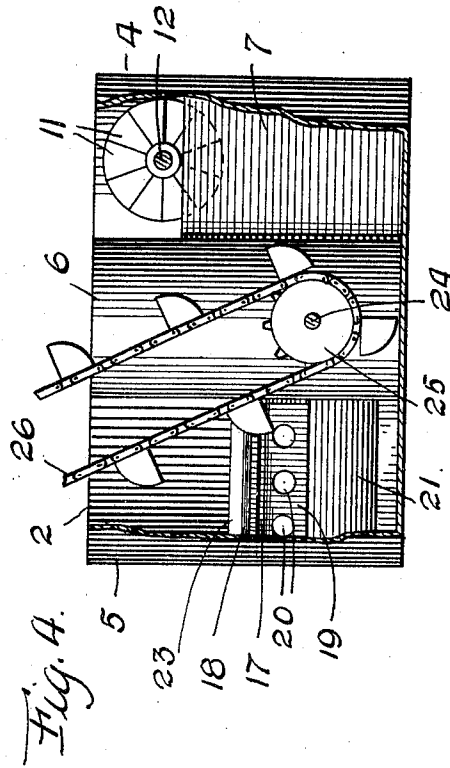
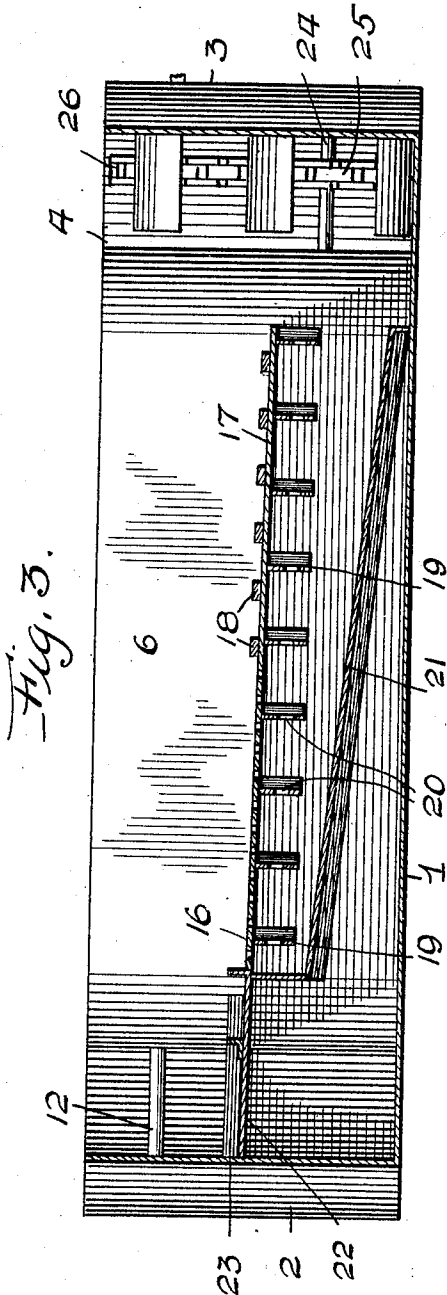
WITNESSES
Samuel Payne.
J. P. Appleman,

INVENTOR
S. L. Boggs.
BY *A. C. Everett & Co.*
ATTORNEYS

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ATTORNEYS

UNITED STATES PATENT OFFICE.

SAMUEL L. BOGGS, OF PITTSBURGH, PENNSYLVANIA.

SEPARATOR AND COLLECTOR FOR METALS.

1,037,114.

Specification of Letters Patent.

Patented Aug. 27, 1912.

Application filed April 6, 1912. Serial No. 689,001.

To all whom it may concern:

1. Known that I, SAMUEL L. BOGGS, a citizen of the United States of America, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Separators and Collectors for Metals, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a separator and collector for metals, especially designed for separating precious metals from ore.

The primary object of my invention is to provide a combined washer, mixer, pulverizer, agitator and amalgamating machine for separating metals from ore and other substances.

Another object of this invention is to provide a metal separating and collecting apparatus that can be advantageously used where hydraulic mining is resorted to for obtaining ore containing precious metals.

I attain the above objects by an apparatus that is inexpensive to manufacture, durable, easy to operate and highly efficient for the purposes for which it is intended. The apparatus is constructed whereby a continuous washing of ore can be carried on to obtain every particle of precious metal contained within the ore. The apparatus has been especially designed for the south western gold fields where a slimy and tenacious ore is obtained that must be pulverized and disintegrated to that extent that each and every particle thereof can be subjected to the action of water for washing purposes. The pulverizing and disintegrating of the ore mixes and agitates the same to that extent that gold is liberated to be washed or carried to amalgamating plates that collect the same.

In using the apparatus, I resort to a continuous circulation of water for washing the ore and the course of the water is such as to carry the ore over riffle-boards and amalgamating plates whereby a maximum amount of gold will be collected. The washing of the ore is accomplished by a minimum expenditure of water, and while heretofore it has required the flow from a thirty-six inch pipe to wash a hundred tons, it now only requires the flow from an inch pipe to accomplish the same amount of washing.

With this understanding of my invention, reference will now be had to the principles

of the same, as disclosed in the accompanying drawing, wherein:—

Figure 1 is a plan of the separator, partly broken away, Fig. 2 is a longitudinal sectional view of the same taken on the line II—II of Fig. 1, Fig. 3 is a similar view taken on the line III—III of Fig. 1, and Fig. 4 is a cross sectional view of the separator.

A separating and collecting apparatus in accordance with this invention comprises an oblong tank having a bottom plate 1, end walls 2 and 3 and side walls 4 and 5.

Arranged upon the bottom plate 1 is an oblong structure 6 that provides an endless passageway or slush trough that is lined by the walls of the structure 6 and the walls 2 to 5 inclusive of the tank. The oblong structure 6 corresponds in height to the walls of the tank and one end of said structure is connected to the side wall 4 by a vertical partition 7 that provides an impounding tank or refuse receptacle 8 at one end of the tank, adjacent to the wall 3. The partition 7 is of a less height than the structure 6 and the wall 4, as best shown in Fig. 2, and arranged between said partition, the wall 4 and the structure 6 is a slightly inclined platform 9, which may be flat or concave. The platform 9 extends from the partition 7 to the end wall 2 and arranged upon said platform are a plurality of equally spaced transverse riffle-boards 10 that extend from the structure 6 to the side wall 4 of the tank. The riffle-boards 10 constitute deflectors, agitators and collectors and these riffle-boards cooperate with equally spaced blades or agitators 11 that are carried by a revoluble longitudinal shaft 12. The shaft 12 is journaled in the end walls 2 and 3 of the tank and the shaft protrudes from the end wall 3 and is provided with a belt wheel 13, whereby said shaft can be driven from a suitable source of power. The blades or agitators 11 are disposed whereby they will cooperate with the riffle-boards 10 in agitating, stirring and commingling a liquid or solid matter held in suspension by the liquid that passes over the platform 9 between the structure 6 and the side wall 4 of the tank. The blades or agitators 11 chop and disintegrate large pieces of ore deposited upon the forward end of the platform, and as the ore is subjected to the action of water, fine particles of gold or other metal are easily separated

from the ore. To facilitate the passage of water over said platform and maintain the same in circulation, the revoluble shaft 12 is provided with a propeller 14, said propeller being located adjacent to the end wall 2 of the tank, and cooperating with the blades 11 in keeping the water in motion.

The confronting sides of the structure 6 and the side wall 5 support a detachable perforated plate 16 that is slightly inclined and is interposed in a horizontal platform 17 that connects the structure 6 and the side wall 5 of the tank. The platform 17 has transverse equally spaced riffle-boards 18 that serve as retarders and collectors, that is, they tend to dam or back up the fluid or solid matter that passes between the structure 6 and the side wall 5, thereby retarding the flow to that extent that particles of gold can settle upon the riffle-boards or pass through the perforated plate 16. Two circulations of water are obtained, the circulation of water above the plate 16 being faster than that below the plate, consequently particles of ore can be more readily collected below the perforated plate than above the same.

Below the perforated plate 16 and the platform 17 there are arranged transverse equally spaced and vertically disposed amalgamating plates 19 having openings 20 that permit of water passing through said plates. The plates 19 are of the ordinary and well known type employed for amalgamating, the plates being treated with quick silver that collects the gold and retains the same until a "clean-up". Located below the amalgamating plates 19 is an inclined amalgamating plate 21 that extends from one end of the structure 6 to the opposite end thereof, the lower end of said amalgamating plate terminating at the impounding tank or receptacle, whereby solid matter not retained thereby is carried into the impounding tank.

Between the end wall 2 and the end of the structure 6 is a transverse inclined platform 22 extending from the platform 9 to the perforated plate 16. This platform has riffle-boards 23 serving as agitators or retarders for the water that passes from the platform 9 to the perforated plate 16.

Revolubly mounted in the end wall 3 and the end of the structure 6, within the impounding tank 8, is a shaft 24 provided with a conveyer wheel 25 for a conveyer 26, and this conveyer is adapted to remove solid matter from the impounding tank 8.

The tank is filled with water until the blades or agitators 11 are covered. The ore is then deposited upon the platform 9, adjacent to the partition 7. The ore commingles with the water within the tank and is agitated by the blades 11 and carried over said platform to the platform 22 and from

the platform 22 over the perforated plate 16. The water is maintained in circulation around the structure 6 and against the walls 2 to 5 inclusive by the blades 11 and the propeller 14, consequently metallic substances are always held in suspension by the water and during the course of the water, the metallic substances pass through the perforated plate 16 and are collected by the amalgamated plates 19 and 21. The plates 19 and 21 can be removed from time to time and cleansed or new plates installed. The riffle-boards collect a certain amount of gold and from the foregoing it will be observed that the washing of ores and the extracting of metal can be accomplished by an exceedingly simple apparatus that embodies an endless trough in which ore is disintegrated and shifted until the metal to be collected is liberated.

It is thought that the operation and utility of the apparatus will be apparent without further description, and while in the drawing there is illustrated a preferred embodiment of the invention, it is to be understood that the structural elements thereof are susceptible to such variations and modifications as fall within the scope of the appended claims.

What I claim is:—

1. A separator and collector for metals embodying a tank adapted to contain a body of water and provided with means to constitute a trough through which the water is circulated and into which ore can be dumped, amalgamating plates arranged below one end of the bottom and in proximity to one end of the trough, a screen interposed in the bottom of the trough and above the amalgamating plates and constituting means for supplying water containing small particles of metal to said amalgamating plates to be taken up by these latter, riffle boards arranged on the bottom of said trough, and means arranged in said tank above the bottom of the trough for maintaining a continuous circulation of water through said trough and over said plates.

2. A separator and collector for metals embodying a tank adapted to contain a body of water and provided with means to constitute a trough through which the water is circulated and into which ore can be dumped, amalgamating plates arranged below one portion of the bottom of the trough, a screen interposed in the bottom of the trough and above the amalgamating plates and constituting means for supplying water containing small particles of metal to said amalgamating plates to be taken up by these latter, riffle boards arranged in said trough, means arranged in said tank for maintaining a continuous circulation of water through said trough and over said plates, and means supported and operated by said

first mentioned means for disintegrating ore within the trough.

3. A separator and collector for metals comprising a tank adapted to contain a 5 body of water, means arranged within the tank to constitute a substantially V-shaped course for the travel of ore, a perforated plate interposed in said course near one end thereof, amalgamating means arranged be- 10 low one end of said course and under said plate, and means arranged within said tank over said course for maintaining a circulation of the water therein.

4. A separating and collecting apparatus 15 for metals comprising a trough, riffle boards arranged therein, a screen interposed in the bottom of said trough, screened amalgamating plates arranged below a portion of the bottom of said trough and farther below 20 said screen, means for maintaining a circulation of water through said trough and over said amalgamating plates, and means operable in unison with the first mentioned means for disintegrating and agitating 25 metal bearing ore placed in the trough.

5. A separating and collecting apparatus for metals comprising a trough, riffle boards arranged on the bottom thereof, a screen interposed in the bottom of said trough near 30 one end thereof, screened amalgamating plates arranged below one end of the bottom of said trough and farther under said screen, means arranged above the bottom of the trough for maintaining a circulation of 35 water through said trough and a current of water over said amalgamating plates, means arranged above the bottom of the trough for disintegrating and agitating metal bearing ore placed in the trough, an impound- 40 ing tank into which that end of the bottom of said trough having the plates arranged thereunder opens for the reception of the tailings, and means for removing the tailings from said impounding tank.

45 6. A separator and collector for metals comprising a tank adapted to contain water, an oblong structure arranged in said tank, inclined platforms arranged between said structure and the walls of said tank, agi- 50 tators arranged above one of said platforms, a perforated plate forming a part of another platform, amalgamating plates arranged be-

low said perforated plate, an inclined amal- gamating plate arranged below said plates, a conveyer arranged within one end of said 55 tank for removing solid matter therefrom, and means operable in unison with said agitators for maintaining a circulation of water within said tank.

7. A separator and collector for metals 60 comprising a receptacle adapted to contain a body of water and provided with means to constitute a riffled course for the travel of free milling ores to separate the metals therefrom, said receptacle further provided 65 with means to constitute an impounding tank with which said course communicates, means arranged within said receptacle below and communicating with said course for amalgamating the finer portions of the ore 70 to collect the metals therefrom, said amalgamating means opening into said tank, means for directing currents of water simultaneously over said course and said amal- gamating means to cause the travel of the ore 75 over said course and said means, and means extending into said tank for removing the tailings therefrom.

8. A separator and collector for metals comprising a receptacle adapted to contain 80 a body of water and provided with means to constitute a riffled course for the travel of free milling ores to separate the metals therefrom, said receptacle further provided with means to constitute an impounding 85 tank with which said course communicates, screened amalgamating means arranged within said receptacle below and communi- cating with said course for amalgamating the finer portions of the ore to collect the 90 metals therefrom, said amalgamating means opening into said tank, means for directing currents of water simultaneously over said course and said amalgamating means to cause the travel of the ore over said course 95 and said means, and means extending into said tank for removing the tailings there- from.

In testimony whereof I affix my signature in the presence of two witnesses.

SAMUEL L. BOGGS.

Witnesses:

MAX H. SROLOVITZ,
CHRISTINA T. HOOD.

It is hereby certified that in Letters Patent No. 1,037,114, granted August 27, 1912, upon the application of Samuel L. Boggs, of Pittsburgh, Pennsylvania, for an improvement in "Separators and Collectors for Metals," an error appears in the printed specification requiring correction as follows: Page 3, line 6, for the word "V-shaped" read *U-shaped*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22d day of October, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.