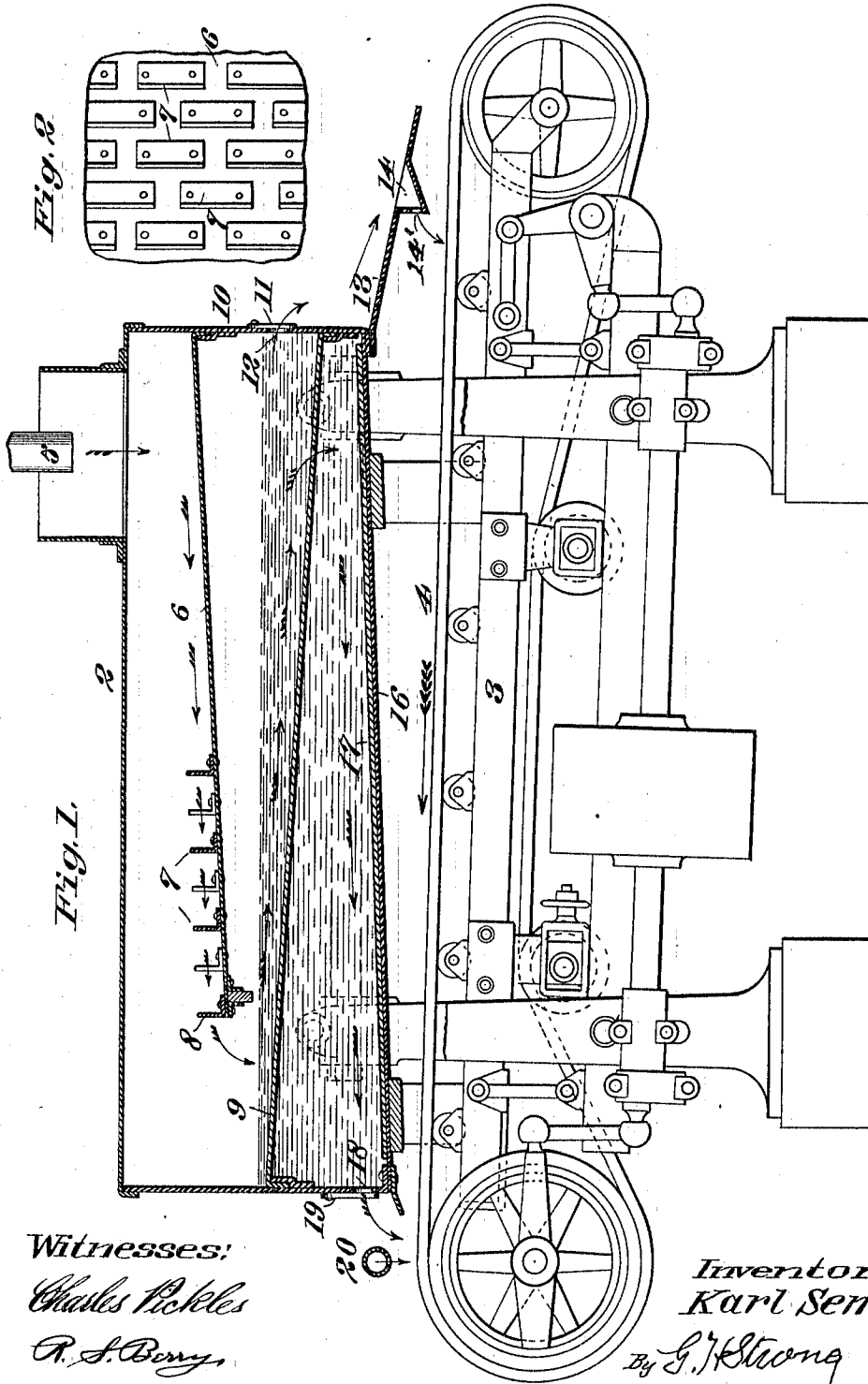


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 COMBINED SPREADER, CONCENTRATOR, AND AMALGAMATOR.
 APPLICATION FILED JULY 22, 1912.

1,059,495.

Patented Apr. 22, 1913.



UNITED STATES PATENT OFFICE.

KARL SENN, OF ALAMEDA, CALIFORNIA.

COMBINED SPREADER, CONCENTRATOR, AND AMALGAMATOR.

1,059,495.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed July 22, 1912. Serial No. 710,812.

To all whom it may concern:

Be it known that I, KARL SENN, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Combined Spreaders, Concentrators, and Amalgamators, of which the following is a specification.

The present invention relates to pulp treating apparatus, and particularly to a combined spreading, concentrating and amalgamating apparatus.

The object of the present invention is to provide a pulp distributor, adaptable for coöperation with a concentrating machine; the distributor involving means for spreading the pulp, means for amalgamating free gold, or other amalgamable metal, and to concentrate a part of the pulp from the tailings before the pulp is delivered to the subsequent concentrating machine.

The invention consists of an apparatus adapted for coöperation with an amalgamating machine having lateral or orbital movement, wherein the pulp being handled can be evenly spread, concentrated and partly amalgamated.

Figure 1 is a central vertical section through the apparatus as applied to a concentrating machine. Fig. 2 is a detail plan view showing staggering plates.

My present invention comprises a tank, box, or other structure 2, of suitable length, width and depth, which is adapted to be mounted upon a concentrating machine, a portion of the frame of which is indicated at 3, and over which runs a belt 4, moving upwardly in a slightly inclined plane.

The concentrating machine, including the frame and belt, preferably has an orbital movement to produce a pan-like action upon the structure 2 which is mounted thereon, so that pulp fed in from a pipe 5 will, when deposited upon an inclined plate 6, flow downwardly toward and against staggering plates 7, which project upwardly from the plate 6; the latter terminating somewhat short of one of the ends of the box 2, the pulp falling over the discharge end 8 of the plate onto a diaphragm or plate 9 which is inclined downwardly and oppositely to the plate 6, so that the water and pulp falling to the plate 9 will flow toward the rear end 10 of the box which is provided with a plurality of regulating gates 11, covering apertures 12 through which water and pulp

may discharge onto an apron 13 projecting from the rear end of the box, and having a depression or riffle 14 for the purpose of collecting such heavy articles or concentrates in the pulp as may have escaped from the box.

Near the lower end of the concentrating plate 9 is provided a discharge opening 15, through which the concentrates settling on the plate 9 will discharge onto the bottom 16 of the box, which preferably is provided with a copper plate mercury coated, so that as particles of gold and other material flow down the inclined bottom 16, such particles as will amalgamate, as floured mercury, are caught by the mercury on the copper plate 17; the concentrates finally discharging from the lowermost end of the box 2 through apertures 18, which are covered by regulating gates 19 on the forward end of the box.

The efficiency of the present spreader and concentrator is increased when the box 2 is mounted upon a concentrating table or apparatus, such as indicated at 3, which has an orbital movement; this being known to cause the rapid settling of concentrates and values in pulp. If pulp be fed through the pipe 5 into the concentrating box 2, the peculiar orbital movement of this box rapidly segregates the concentrates and the values from the gangue; the latter issuing through the discharge apertures 12, the concentrates discharging from the apertures or aperture 15 onto the copper plate 17, on which particles may be amalgamated and then the concentrates are finally discharged through the apertures 18 onto the upwardly traveling and orbitally gyrated belt or conveyer 4. In the event that a portion of the concentrates should be discharged onto the apron 13, these will be caught by the riffle 14 which is provided with suitable apertures 14' through which the escaped concentrates will fall to the table belt 4 and be carried upwardly thereon.

The efficiency of the present apparatus is produced because of the peculiar conditions of separation wherein the ore is primarily concentrated in the box 2 before it reaches the belt 4; this preliminary concentration delivering at a point higher up on the belt 4, the concentrates issuing from the apertures 18, whereas the tailings or gangue is discharged from the apron 13 at a position on the belt 4 considerably lower than the position at which the concentrates are depos-

ited on the belt, so that clear water fed to the belt surface from a pipe 20 will flow over the deposited concentrates with less chance of carrying these downward because they are, instead of being intimately com- mingled with mass pulp, previously washed and concentrated from the pulp by the box 2; the clear water running over the concentrates and beneath the box and eventually into the pulp discharged from the end of the apron 13 onto the belt 4, the clear water further washing the pulp to carry it away and leave whatever concentrates may have been carried through the discharge or dis- charges 12.

It will be seen from the foregoing that the labor of the clear water fed to the belt 4 is greatly reduced and consequently a better concentration is produced because of the preliminary concentration or separation of the concentrates from the lighter gangue because of the employment of the box 2.

Occasionally, for the purpose of a clean- up, the staggering plate 6, the concentrating plate 9, and the amalgamating plate 17, may be removed from the box 2, and when cleaned, readily replaced.

The utility of the apron 13 with its riffle or riffles 14 is that by it fines may be recovered, it being well known that it is very difficult to recover fine particles of values in a concentr- ating apparatus where the pulp is treated in a mass. By the present apparatus the heavier values are concentrated and the very light particles may be carried away in the gangue, but an opportunity for the collec- tion of the escaping fine values is obtained by the use of the apron 13 over which the tailings pass. Such fine values as are col- lected in the riffle 14 are deposited on the belt 4 at a position farther up on the belt than the tailings are, so that the collected fines are not subjected to mixture with the tailings and therefore can not be washed away with and by them.

Having thus described my invention, what I claim and desire to secure by Letters Pat- ent, is—

1. The combination in ore handling appa- ratus, of a plate for spreading pulp, a con- centrating plate arranged below the spreader plate, a container in which said plates are

mounted, said container having a discharge at one end for concentrates and a discharge at the opposite end for tailings, and a con- centrating surface upon which the gangue is deposited at one position from the con- tainer and the concentrates deposited at a higher point from the container and where- on the ore is further concentrated.

2. The combination in concentrating ap- paratus of a container, means for moving the container, said container having a plate on which ore is deposited and plates project- ing in staggered positions from the plate to distribute the ore, a concentrating surface onto which the ore discharges from the spreading plate, said concentrating plate having an aperture adjacent its lower end through which concentrates issue, means at the rear end of the container and upon the concentrating plate for controlling the dis- charge or pulp from the container, and means at the opposite end of the container for controlling the discharge of concen- trates from below the concentrating plate.

3. The combination in concentrating ap- paratus of a container, means for moving the container, said container having a plate on which ore is deposited and plates project- ing in staggered positions from the plate to distribute the ore, a concentrating surface onto which the ore discharges from the spreading plate, said concentrating plate having an aperture adjacent its lower end through which concentrates issue, means at the rear end of the container and upon the concentrating plate for controlling the dis- charge or pulp from the container, means at the opposite end of the container for con- trolling the discharge of concentrates from below the concentrating plate, and an amal- gamating device arranged below the concen- trating plate and over which the material issuing from the aperture in the concentrat- ing plate travels.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

KARL SENN.

Witnesses:

G. H. STRONG,
GENEVIEVE S. DONELIN.